TEXTILES PAPER LEATHER

AMERICAN DYESTUFF REPORTER

Including the Proceedings of the
AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

VOLUME XI JULY 17, 1922 NUMBER 2

FEATURES OF THIS ISSUE

The first instalment of "Efficiency in the Worsted Dyehouse," by B. T. C., discusses working conditions, steam, temperature, water, preliminary and actual dyeing operations.

In "A Consideration of the Various Substances Used in the Construction of Dyeing and Bleaching Utensils and Apparatus," Grandage and Hadley take up wood and slate, cement, copper and lead.

"Things Every Textile Chemist and Colorist Should Know," No. 6, treats of "Chlorinated Wool."

"Attack Well Timed," Says Garvan of Political Raid on Chemical Foundation.

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[**Published by the American Dyestuff Reporter in co-operation with The American Association of Advertising Agencies**]

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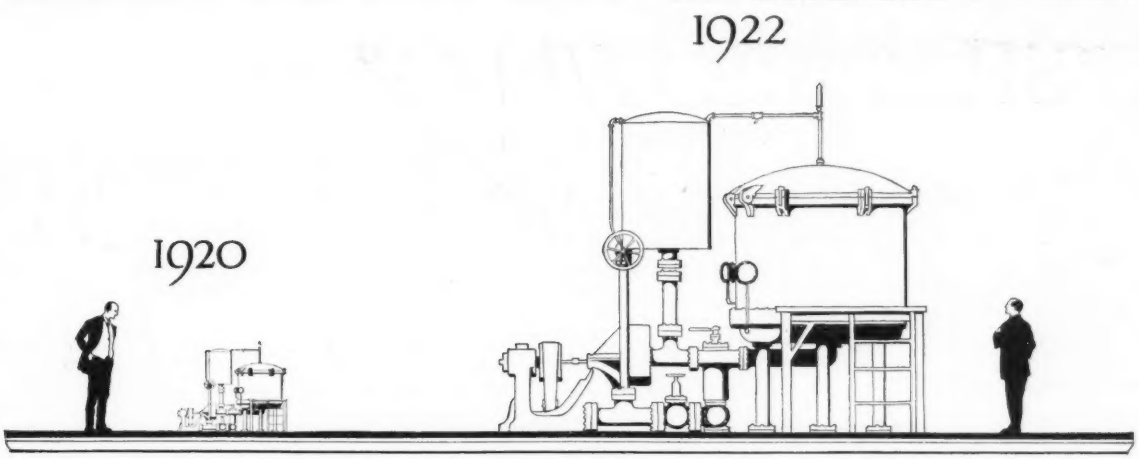

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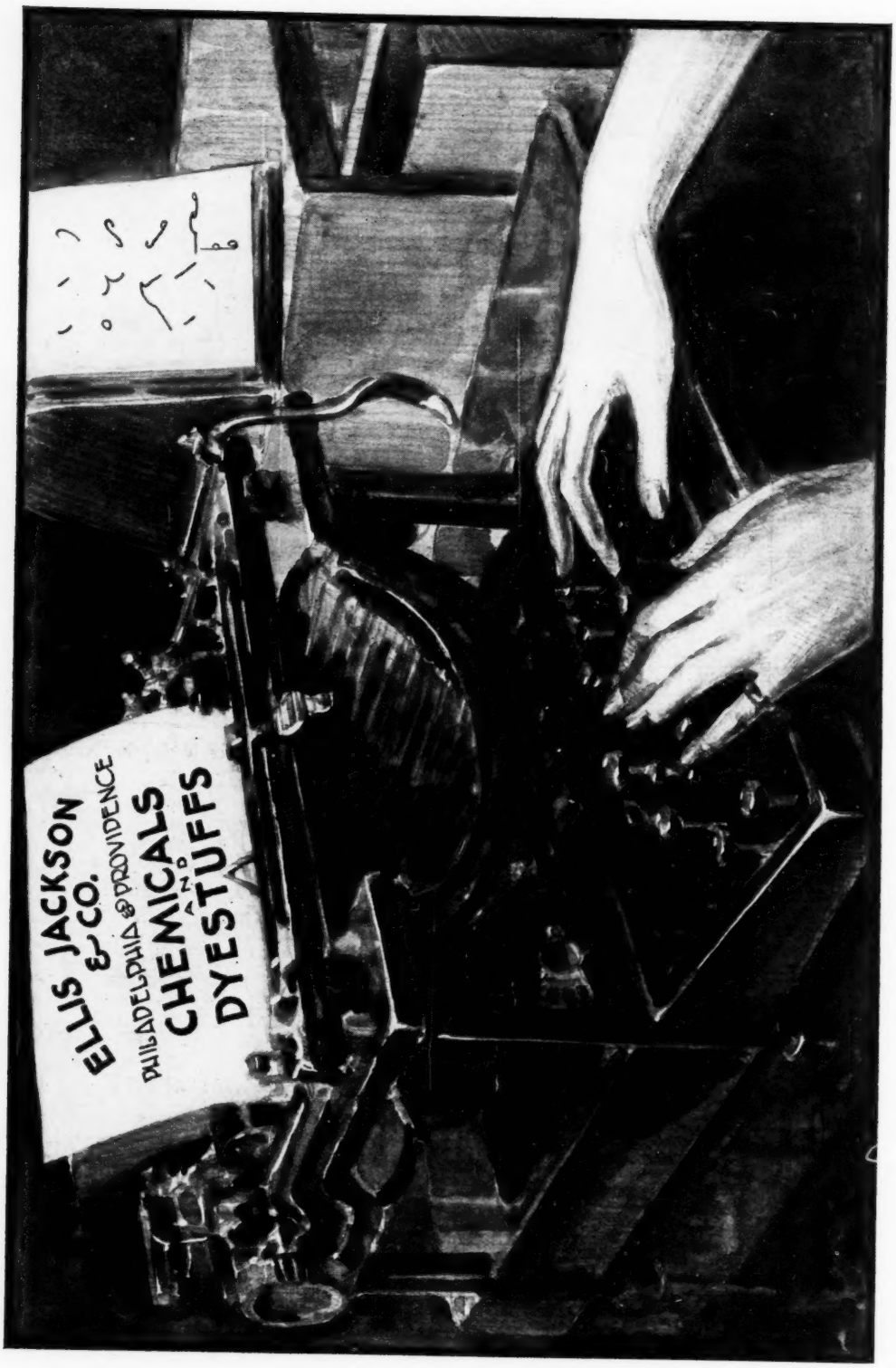
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Efficiency in the Worsted Dyehouse

Laxity Leads to Waste and Losses—Working Conditions and Efficiency—Waste of Steam—Temperature Control—Supervision of Labor—Water and Efficiency—Efficiency in Preliminary Operations—Efficiency During Dyeing

By B. T. C.

EVERYWHERE in modern industrial activity, the hue and cry is for efficiency. If one's interests are centered in business he is forever studying ways and means of increasing the efficiency of his organization, ever striving to keep as far ahead of his nearest competitors as possible. If one centers his efforts on industry he is always devising methods for cutting down waste of any kind. Efficiency destroys waste, because it hates its very presence. Loose methods of administration, misdirection of efforts, wasting of funds, loss of valuable time and countless other features are legitimate prey for the widely used term efficiency. They should be.

And yet in the dyehouse many mills are very lax about the matter. How often we find dyehouses dark and dingy, damp, poorly lighted, poorly ventilated and so full of steam that one would think he were in a fog. The old theory of building dyehouses in any sort of fashion is responsible for this. Still the management expects the dyer to produce results which are well-nigh perfect, even when he is laboring under the most difficult of conditions. Many of the smaller mills even lack chemical laboratories in these supposedly enlightened times. And these are by no means exaggerated cases.

Dyeing efficiency really means getting the most out of the dyes and chemicals used, the machines or kettles in which the dyeing takes place, and the labor which uses the one and operates the other. This means that the dyer should be sufficiently well informed, both by study and from experience, to be able to know when he is getting the best results obtainable from the materials with which he must work. In other words, he should be a master dyer and not merely a shade matcher.

Working Conditions and Efficiency

Poor ventilation is one of the grave defects connected with most dyehouses. In the past this was often overlooked, but the day is now long distant when working conditions may be relegated to a place of secondary importance. The health of the laborer must be considered. Needless to say, 100 per cent results cannot be obtained from workers who are but 80 per cent efficient due to unhealthful surroundings, no matter how well they may be instructed in their duties or how closely they maye be watched by the foreman. After the ventilating systems provided are totally incapable of carrying off waste steam from the boiling dye kettles, and all must agree that an atmosphere of steam isn't the healthiest breathing place for human beings.

Put aside the health point of view and consider the question from a technical standpoint. Whenever the excess steam as it rises comes in contact with the cold surfaces of beams, supporting struts, shafting, the ceiling, or fire sprinkling systems it condenses to water and naturally falls to the floor below. If unneutralized carbonized goods or if pieces which have been dyed light shades are beneath these drops of water there is ever the danger of spots and stains. Unneutralized carbonized goods must never be allowed to become wet under any circumstances until they are ready for dyeing. In fact, the best use is to keep all such pieces out of the dyehouse altogether until it is time to throw them into the kettles. If possible—and it should be—all dyed pieces as soon as they are removed from the kettles should be trucked out of the dyehouse. A dyehouse is a mighty poor place in which to leave woolen or worsted goods, dyed or undyed.

In an atmosphere saturated with steam it is often difficult to see if each kettle is running properly, if the pieces have become tangled, as they sometimes will, or if the belts are slipping on the pulleys. Occurrences of this nature cause no end of trouble and produce cloudy and shaded sets. Such conditions, naturally, should be avoided as much as possible or if they occur, corrected at once. Furthermore, if repairs have to be made in a hurry in an atmosphere of waste steam, the repair crew is laboring under difficulties and through no fault of the men.

Of course, when conditions like the above exist some sort of system should be installed to carry off the waste steam. If it is possible to help matters by building new ventilators and installing additional fans well and good. In some dyehouses steam coils have been set close to the ceiling, especially near windows. The air at these points is heated and consequently condensation is prevented. If simple methods such as these fail to produce the desired results there is nothing else to do but consult one of the various firms which specialize in the installation of apparatus for removing excess vapors and steam. A dyehouse may be said to be on the road towards efficiency only when it is well lighted, well ventilated and free from steam. The mill which desires good results in manufacturing must expect to provide reasonable working conditions. Failing to do so, it is not efficient.

Waste of Steam, and Temperature Control

At this point the question arises whether or not an atmosphere of steam is caused, in part at least, by sheer waste. There is no doubt about it; it is. We know, of course, that 212 deg. Fahr. or 100 deg. Cent. is the boiling temperature. But to many operators a violent ebullition signifies the same thing. The temperature may be 205 deg. Fahr and the operator is perfectly satisfied. Of course, there certainly is no waste of steam in this instance, the real danger being lack of steam. On the other hand, many operators fail to realize that no matter how much steam is forced through the open dye liquor the temperature will not rise above 212 deg. Fahr. And that is where a great deal of steam is wasted, even when everyone is cautioned that under no conditions should the atmosphere be allowed to absorb steam which has done no useful work!

Temperature is very important in the dyeing process and should be controlled scientifically. There are a number of thermostatic devices on the market to-day which regulate the amount of steam equipped with such a device because, first, the steam may be automatically controlled; second, the time required to raise the set to the boil may be closely regulated, and third, waste is avoided.

Needless to say, all steam pipes should be covered with the best grade of insulating material. Loss by radiation from uncovered steam pipes is enormous. If in addition to this there is a wastage of steam during the dyeing process itself, it is plain to be seen that a large proportion of the coal pile is a total loss to the mill. A dyer naturally is always particular about bringing out goods in first-class condition. To be really efficient he should also endeavor to keep the cost of operating his department at the lowest possible figure.

Efficient Supervision of Labor

Handling the labor question efficiently in the average dyehouse is often a difficult thing to accomplish. This is due to two reasons: First, a large proportion of dyehouse help is unintelligent and unskilled, and second, a great many laborers do not understand clearly the English language. With employees of this type misunderstandings as to orders are bound to arise. The only solution to the problem is to have a number of foremen, that number depending on the size of the dyehouse. These foremen should be able to speak and understand both English and the language of the help.

They should have direct charge of all the kettle hands, being answerable only to the assistant dyer and the dyer. The foremen should have charge of instructing new men in their duties as well as of watching the help in their daily routine work. They should see that dyestuffs are properly dissolved and added to the kettles carefully, that all chemicals called for by the formulae have been added at the proper time and in the amounts specified, and that the temperature has been raised according to orders. They should watch the men when color additions are being made to the hot liquor, control the length of the boil, the rinsing, and the removal of the pieces from the kettles. In short, the foremen should be held responsible for the daily routine and should maintain discipline. The dyer is then able to supervise and control the technical part of the work far better than if he has to watch each and every machine himself.

Redye and repair reports should be studied carefully. Kettles in which such trouble occurs should be examined for mechanical defects such as improper distribution of steam, etc. The men operating the kettles then should be cautioned against carelessness and instructed anew as to their duties. The following rules should be impressed upon them:

1. Never add more acid than given orders to, and then only when properly diluted with water.

2. Never allow acid to spatter upon the pieces. This also applies to dissolved dyestuffs.

3. Never bring the machines to a boil before the allotted time.

4. Be extremely careful when making color additions.

5. Never stop the machines while the pieces are in the boiling liquor. Turn off the steam before cutting samples.

6. Be careful during rinsing, especially at the start. Don't allow cold water to strike the goods directly.

7. Report all mechanical defects such as leaking kettles, broken steam pipes or slipping pulleys as soon as discovered to the foreman.

If after these precautions cloudy pieces continue to occur and are due to carelessness the man in question, after being given a fair chance, should either be discharged or taken from the kettles.

With efficient foremen the dyer always has efficient help. When he has, both his percentages of redyes and repairs are cut to a minimum, resulting in a saving of labor, dyestuffs, chemicals, time and steam.

Water and Efficiency

Perhaps the best way to approach this subject would be to explain chemically just what hard water is and also its effect upon dyeing and finishing. As is well known, a water of zero hardness is ideal for dyeing and finishing. Hardness, of course, is due to the presence of soluble calcium and magnesium salts in water; in some instances certain iron salts act in much the same manner. Hardness may be temporary or permanent, depending on the kinds of sales in solution, and at the times we may have a combination of both. Temporary hardness is due to the presence of calcium bicarbonate [$Ca(HCO_3)_2$] and magnesium bicarbonate [$Mg(HCO_3)_2$]. By boiling water containing these salts the soluble bicarbonates break up into the insoluble carbonate, forming carbon dioxide and water at the same time. The following reactions illustrate this:

$$CaH_2(CO_3)_2 + \underset{\text{Heat}}{\triangle} = CaCO_3 + CO_2 + H_2O$$

$$MgH_2(CO_3)_2 + \triangle = MgCO_3 + CO_2 + H_2O$$

These normal carbonates, as they are called, are insoluble and hence are precipitated out. Thus by boiling, temporary hardness may be overcome.

When we have permanent hardness, however, we face an entirely different proposition. Hardness in this case is due to the presence of calcium chloride, [$CaCl_2$], calcium sulphate [$CaSO_4$], magnesium chloride [$MgCl_2$], magnesium sulphate [$MgSO_4$]; in short, any soluble sulphate, chloride or nitrate of a metal which forms insoluble soaps. Boiling has absolutely no effect on such water. Consequently the so-called water softening processes come into use. One of the earliest water softening methods called for the addition of sodium carbonate [Na_2CO_3], and at times calcium hydroxide [$Ca(OH)_2$], to the water in the right proportions. The sodium carbonate, for example, reacted with calcium sulphate forming the insoluble calcium carbonate and sodium sulphate. It simply was another case of double decomposition.

$$CaSO_4 + Na_2CO_3 = CaCO_3 + Na_2SO_4$$

The calcium salt was thus rendered insoluble and the water consequently was softened. A more recent and successful method calls for the treatment of the soluble calcium and magnesium salts with the sodium zeolites. The insoluble calcium and magnesium zeolites are formed and filtered off, after which the water is sent to the wash house and dyehouse.

As is well known, hard water reacts with soap. Soaps, as we use them in the mill, are the sodium salts of stearic, oleic, palmitic, margaric, etc., acids. Soluble calcium, magnesium and iron salts react with the soluble soaps forming calcium, magnesium or iron soaps which are insoluble, sticky and curdy. From a scouring point of view, the result is that large quantities of soap thus are wasted in the wash house, meaning a loss in dollars and cents to the mill and increased business for soap manufacturers.

From a dyeing point of view, hard water tends to the production of poor dyeings. If wool in any form comes to the dyehouse to be dyed it should be absolutely clean. This is practically impossible if curdy calcium and magnesium soaps are deposited on the fibers—and such is the case generally when hard water is used in scouring. In some instances the sticky soaps hold the dyestuff mechanically, the result being that after dyeing and finishing the batch rubs or crocks. In addition to this the set is often unevenly dyed. Of course, the danger of uneven dyeing is not so serious in stock dyeing as, due to carding, spinning and weaving, a blending is accomplished. Even in the case of yarns, unevenness of shade may be less noticeable after weaving. In the dyeing of piece goods, however, it is almost impossible to cover up defects due to soap being in the pieces when they were dyed. Redyeing to a darker shade or even stripping often fails to give the desired results. In many cases black is the only color that will cover the defects and make the goods marketable.

It has been said that hard water tends to precipitate a certain proportion of the dyestuffs dissolved in it. Much, however, depends on the class of colors being used. Precipitation, as a rule, is apt to occur if chrome or top-chrome colors are used. Basic colors, although seldom dyed on wool, work best in soft water. Acetic acid has been added to counteract hardness when basic dyestuffs are supplied, but unless one is very careful an excess of acid results, all of which hinders the exhaustion of the dye bath. Precipitation, however, does not occur as a rule when acid colors are used. On the other hand, the dyer may face another difficulty. The curdy soap deposits on the wool fibers may be decomposed by the acid contained in the boiling dye bath. This naturally liberates the free fatty acid and again we have streaky and cloudy results in the dyed pieces.

From the above short chemical discussion of hard waters and their effect upon wool scouring and dyeing it is plain to be seen that efficient results may be ob-

tained only when soft water is used. Hard water costs many mills thousands of dollars annually due to wastage of soap and also to incomplete cleansing of the goods. This means that poorly scoured pieces are apt to dye unevenly, which means rehandling and a further loss of money to the mill. The day is fast approaching when it will be necessary for every mill to use water of zero hardness.

Efficiency in Operations Preliminary to Dyeing

Each and every millman realizes that for a mill to be efficient the closest sort of co-operation must exist between the wet finisher and the dyer. It stands to reason that if pieces are to be dyed properly they must be cleaned properly. This means that all wool oils added intentionally, all sizing material, all dirt and grease picked up and held mechanically by the fibers must be completely removed. Not only this, but the rinsing must be thorough enough so that every last bit of soap used during the scouring is removed from the pieces. This, to be most effective, calls for soft water.

Wet finishers when pressed for time have been known to hurry the rinsing. Rinsing can never be hurried. There is an old rule which says that the rinse should take twice as much time as the scour. It should be followed. To send pieces to the dyehouse when they contain even the slightest amount of soap means that the goods can never be dyed properly. The moment a mineral acid such as vitriol strikes the pieces, the least traces of soap are changed into the free fatty acid. Cloudy pieces are the result. Even when the dyer treats his goods with ammonia at 110 deg. Fahr. for half an hour as a precautionary treatment before dyeing, the danger may not be overcome.

The same holds true if the pieces are sent to the carbonizing department when all traces of soap are not removed. The sulphuric acid immediately forms the fatty acid as in dyeing, and again we have streaky goods. It is folly to hurry any operation of textile manufacturing, but it is a sheer waste of money to shorten the rinse after scouring. Pieces so treated in nine cases out of ten will later have to be redyed into black.

If the goods are carbonized in the piece care must be taken that the saturation with acid is uniform; that the pieces are squeezed evenly, and that there is good ventilation in the dyeing oven. Ventilation is not so important in the case of the baking oven. Dyeing is often an uncertain game in any event, but it is a hopeless task unless the goods are scoured, rinsed and carbonized properly.

Pieces come to the dyehouse in the gray either from the carbonizing department, generally unneutralized, or from the washhouse, in which case they are wet. The carbonized pieces should be kept apart from the wet goods so that there is no danger of wetting the unneutralized pieces. All goods should be kept covered either with cotton cloth or oilcloth and no set should be sent into the dyehouse proper until ready for dyeing. Express pieces should be kept separate from the regular goods in order that the dyer may place his hands on them as needed. The same rule holds true with samples. Unless the wet pieces are to be dyed during the day they should be dried and returned to the dyehouse.

An examining machine should be handy so that sets which are to be dyed light shades may be examined. For spots, dirt, etc., material which is unsuited for light shades should be turned at once into a navy or any other shade that will cover the spots or markings, and new goods ordered from the gray stock department. If goods which are later dyed a light shade are not examined and spots appear on the dyed pieces the dyer must shoulder the blame. Besides this the spoiled pieces must later be redyed to a darker shade which means that they are handled for a second time. All of this is costing the mill money.

Sample pieces should be watched closely. The dyer should be allowed to experiment with new styles until he finds the most satisfactory method of dyeing. If the goods are hard to penetrate, he should dye them according to a procedure wherein the temperature is raised slowly to the boil and the boiling continued for some little time. If on the other hand a new style penetrates well the process may be shortened somewhat by reducing the time required to bring the batch to the boil, etc. In any event, before dyeing a full set of a new and unfamiliar style the overseer should dye first one piece and watch its action closely during the dyeing. The efficient dyer studies, makes discoveries, and abiding by his knowledge proceeds with his dyeing according to his best judgment. Hit or miss guesswork must be avoided.

Efficiency During Dyeing

Having considered operations preliminary to dyeing, we next arrive at the dyehouse itself. Our first consideration will be that of dye kettles and their upkeep. All dyeing machinery, whether it be for raw stock, tops, yarns or piece goods, should be examined at least once a week for mechanical defects. Loose boards should be replaced, projecting nails or screws removed, broken steam and water pipes repaired or new ones installed in their place. The belting should be watched closely, and any belts which are at all weak should be replaced at once by new ones. It is far cheaper to do this than to run the risk of having a belt break while a set is being dyed. Loose belts should be tightened as soon as noticed.

Every kettle should be inspected daily for leaks. The price of dyestuffs is still too high to allow color to run away into sewers. Kettle operators should be instructed to oil the bearings of their machines daily and at the same time warned of the danger of getting oil inside the kettles. The aperture of all steam pipes

should be kept clean of tufts of wool, string, or waste of any kind in order that the distribution of steam in each kettle may be as uniform as possible. Strong cotton bags should be tied around the outlets of all water pipes in order that all rust and sediment suspended in the water may be filtered off. Naturally, all kettles when not in use should be kept filled to the brim with water. Furthermore, if it is necessary to use a machine which has not been run for some time it is best to boil it out with Glauber's salt solution. It is safer to take a little more time to clean the machine than not to do so and run the risk of spoiling the set.

It might be well to mention at this time the advantages of an individual drive for each kettle over one drive for a line of kettles. In the first place, the operator is automatically released from the ever-present danger of being injured by fast moving belts. With individual drives all belting, shafting and pulleys are eliminated. This naturally allows for better light and working conditions. Furthermore, with the absence of all shafting the danger of oil spots on the pieces is removed. Another great advantage is the ability to run one kettle overtime or to start one alone without driving the line of shafting and pulleys for all kettles. However, the greatest advantage perhaps is this: If a motor driving a line of shafting breaks down a line of ten or a dozen kettles is put out of operation. With goods in these kettles at a boil the result is obvious. The pieces are most likely ruined and must be redyed black. With a system of individual drives one kettle is independent of another and such an accident as the above would of necessity be limited to but one kettle.

While it must be admitted that the initial expense of installing a number of small motors is greater than that of setting up a few large motors and have each run a separate line of shafting, the advantages are such as to offset the increased initial cost. The installation of industrial drives for dye kettles is a long step towards dyehouse efficiency.

(To be concluded.)

A Consideration of the Various Substances Used in the Construction of Dyeing and Bleaching Utensils and Apparatus

Part I.

The Continuous Search for Improvements in Dyeing and Bleaching Vessels—Wooden and Slate Vessels—Limitations of Wood—Idle Equipment—Cement for Linings—Use of Copper—Use of Lead

By H. GRANDAGE and W. E. HADLEY

FROM the time of the first coloring, carried out in hand-hewn wooden vessels, until the present day, constant investigation and research work has been under way looking toward the improvement of the various types of apparatus employed in the application of the dyeing and bleaching substances required in processing the many groups and classes of textile materials.

When the dyeing industry was in its infancy, hand-hewn wooden vessels were largely used, but as the needs of the industry increased this type of apparatus was replaced with the slate slab dye vessels under which a fire could be built for the application of heat to the dyeing process.

Limitations of Wooden Vessels

With the general progress made by the wood crafts, together with the application of steam for heating purposes, came the present-day wooden dye vessels, which have probably enjoyed a longer and more varied use than any preceding types of apparatus.

However, in spite of the marked improvements shown by the use of wooden dye vessels, much valuable time was wasted and thousands of dollars' worth of equipment stood idle in the average dyehouse and bleachery where only wooden equipment was used, due to the fact that it was necessary to set aside dye vessels for certain colors and processes and to use them only during a portion of the time.

For instance, a kettle would be in use for dyeing scarlet on cotton yarn; it was necessary after use to thoroughly boil out and bleach or discharge the coloring matter absorbed in the wood before the dyer was able to use this equipment for any other color. There was always the possibility of a careless workman slighting this work, and the inevitable result was a badly stained dyeing. The only safe method for the dyer to follow was to assign a kettle for red, one for blue, one for brown, etc.

In view of the foregoing conditions, the progressive dyer and mill owner was constantly searching for a means of overcoming the necessity for investing so great an amount of capital in apparatus which must remain inactive a large portion of the time.

The management of many dyehouses experimented with various types of linings, such as cement on metal lath, copper, lead and various alloys, and in many instances a considerable degree of success was attained and very satisfactory results followed if the apparatus was used solely for those processes which experiment had shown it to be adapted.

The Use of Cement

The natural objection to the use of cement as a lining material lies in its susceptibility to the action of the acids used in the dyeing process, as well as the fact that the expansion and contraction resulting from the varying temperatures is very apt to cause this substance to crack.

When used in the construction of vats which are to be used with lime or chlorine bleaching, in which the liquor is of an alkaline nature, and which do not require extreme changes in temperature, cement serves as an admirable lining and is still used quite generally in many mills.

The Use of Copper

Copper has been very largely used as a lining material, as well as for the entire construction of dye vessels. It has probably found its greatest application among the woolen and silk dyers, where the so-called "acid colors" find a great field of usefulness. One silk dyehouse, in the city of Paterson, has a "small fortune" invested in the copper vats and utensils in its dyehouse.

An ever-present source of trouble arising from the employment of copper apparatus is the liability of the formation of verdigris, which, in contact with textile material, is bound to cause uneven spots and stains upon it.

Its field of usefulness among the cotton dyers is limited somewhat because of the action of copper on certain of the direct cotton colors, and it is wholly unsuited for use with the sulphur colors, due to the interaction of the copper and sulphur, whereby the brownish black copper sulphide is produced.

The Use of Lead

Lead has found a limited use as a lining material among some of the mills, but has a very decided weakness. The application of heat, and the natural expansion of lead, brings a rift or bulge in the lining which seldom contracts, on cooling, to its original shape. This leaves a ridge or fold, back of which dye liquor or other solutions accumulate, thus causing endless trouble.

Lead linings and piping, however, find extensive use in peroxide bleaching, although the above-mentioned faults are very much in evidence.

Various alloys, such as phosphor bronze, tobin bronze, duriron and many others, have been tried for the construction of dye vessels, linings and general dyehouse fittings, with more or less success.

Probably the alloy which is most generally used at the present time, and the one which is giving the best all-around service, is Monel metal.

The nature of Monel metal, and the uses to which same has been applied in the textile industry, will be covered in a subsequent instalment of this article.

Things Every Textile Chemist and Colorist Should Know

[*Note—Under this heading is introduced as a more or less regular feature the discussion of certain fundamentals which should be a part of every textile chemist's and colorist's working knowledge. It is hoped that such discussions will instruct some of the younger readers, and serve as a review for those of broader experience and knowledge.*]

No. 6
Chlorinated Wool

Action of Chlorine and Hypochlorites Upon Wool

THE action of chlorine and hypochlorites upon wool is ordinarily harmful, although it may be used to advantage in the production of chlorinated wool.

A hot solution of bleaching powder will entirely destroy the fiber, liberating nitrogen. A dilute solution, when cool, will turn wool yellow. For this reason hypochlorite solutions, so extensively used in the bleaching of vegetable fibers, cannot be used in wool bleaching. Even the very dilute solution sometimes used to destroy the residual sulphur dioxide remaining in the wool after bleaching is deleterious to a certain extent.

Chlorinated Wool

Wool readily absorbs chlorine gas, and under certain conditions may take up 30 per cent of its own weight. If the chlorine is dry and the wool not too moist, this absorption of chlorine seems to impart a decided luster, an increased transparency, diminished felting properties and the scroopy feel of silk to the fiber without seriously tendering it. Wool treated in this way is known as chlorinated wool, and is produced commercially. Chlorinated wool also has an increased affinity for dyestuffs, and this fact is used in the production of two-color effects in a single dye bath. This

(*Concluded on page* 51.)

Covering Vegetable Fibers in Woolen Piece Goods

Removing Burrs—Colored Burl Dyeing—Recipe for Color—Making Sure of Satisfactory Results—Solid Shades—Correct Procedure—Two-Bath Methods—Bright Shades—Lodge Evans Process

By W. E. SANDERSON

From a paper presented before the Dewsbury Branch of the Foremen Dyers' Guild.
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THIS process may be divided into three different sections: (1) The dyeing or staining of very small amounts of vegetable impurities which are present, one might say, accidentally in the goods; (2) the dyeing or filling up of larger quantities of cotton with which the dyers, in this district particularly, have frequently to contend; (3) the dyeing of the cotton in materials made up with a white cotton warp, which may also show through the surface, or be quite hidden as in the case of velour cloths.

The first section is, as a rule, a source of considerable trouble to the manufacturer and dyer, as generally speaking the presence of very small quantities of vegetable impurities, whether as burrs or specks or threads of cotton, only becomes apparent after the dyeing operation, and more particularly in material which has been dyed in dark shades; for instance, blacks, navys and nigger browns.

The appearance of these specks as white or only slightly stained spots in the cloth is very objectionable, and their presence would certainly detract from the value of the finished goods. It is essential, therefore, that they be made to so tone with the general appearance of the finished cloth that they cannot be distinguished; or, on the other hand, be removed altogether.

Removing Burrs

The removal of small quantities of burrs or cotton may be effected in one of two ways: (1) By previously carbonizing the goods, which effectively removes all vegetable matter; (2) by mechanically removing the specks of undyed or slightly stained fiber by burling after dyeing.

As for carbonizing, the use of this process presupposes a knowledge of the presence of these impurities, in sufficient quantity to justify the extra cost of the carbonizing operation, and does not concern us in this paper.

With regard to burling, or removing the burls in the finishing process by means of burling irons, this is always a troublesome process; if there is much burling to be done the cost of labor becomes a serious item, and the fact that there is always a risk of damage to the cloth must be taken into consideration.

There is, however, a method of dyeing these vegetable impurities to so closely approximate the color of the dyed material that their presence is quite unnoticeable, or at any rate only apparent upon very close examination. This method is known as burr dyeing, burl dyeing, or inking, and in America speck dyeing.

If the specks are small in number it is possible to stain them in the finishing process by means of the so-called burling inks. These may be made up from the ordinary water-soluble dyes, together with a little methylated spirit, which helps the solution to wet the speck more easily. A better way, in my opinion, is to use dyes which are insoluble in water but may be dissolved in methylated spirits. The advantages of this method will, I think, be quite obvious to you, as the dyes, being unaffected by water, are not removed by subsequent wettings and the effect is undoubtedly more permanent. Spirit Black P dissolved in methylated spirits may be recommended for producing black or gray spots by this method. If other colors are required the range of spirit-soluble dyes made by the British Dyestuffs Corporation will be found quite satisfactory for this purpose.

If, however, the number of specks is so great as to render this method of staining or burling impracticable, then the method of burl dyeing or inking must be adopted. This particular method of dyeing depends upon the fact that while the affinity of cotton for certain direct cotton dyes is very good at low temperatures, the affinity of wool under the same conditions is so slight that it may be considered negligible for all practical purposes. The net result, therefore, is that the cotton may be dyed to almost any desired shade, while the wool is left white or is only very slightly stained.

Before going into the method of application of the direct cotton colors for this particular purpose, I might mention other methods that have been in general use in the past for burl dyeing.

Blacks

Sumac and iron has been and still is largely used. This method gives, on the whole, very good results.

The weight of the material is increased to some extent, though the cloth is inclined to become somewhat harsh in the handle, and it must be admitted that the wool is not left as clear as might be desired; but, of course, in the case of dark navys or blacks this is immaterial.

Logwood has been extensively used for burl dyeing, and I give you a typical formula for a burl-dyeing black made with it. Make up a stock solution in a 40-gallon cask, taking 40 pounds of good Hematine crystals, 36 pounds of soda ash and 12½ pounds of copper sulphate. Add the logwood slowly to about half the cask full of boiling water and stir until it is dissolved. Then add the copper sulphate which has been previously dissolved in a sufficient quantity of hot water, stir well and allow to cool. Now add the soda ash slowly so that the liquid does not froth over. When all the soda ash is in, boil up for three to four hours, then fill up the cask with cold water, stir well, and the solution is ready for use.

The solution is used in the washing machine in the usual way, diluting it with water until it tests at 2½ deg. Tw. When diluted add about two pailfuls of soap solution and run the pieces for about half an hour. Rinse off, first with lukewarm water and finally with cold.

When I was in the works dyehouse we prepared considerable quantities of this logwood burl dye for the use of the scouring department, and the results obtained with it were considered satisfactory, though the results were inclined to be a little lacking in depth.

These then, the sumac and iron method, and the logwood-bluestone and soda ash methods were and still are used to a considerable extent for the filling up of burrs or cotton specks. As a rule, these sufficed for the majority of requirements. If the specks were sufficiently darkened in shade and did not stare, it was considered reasonably satisfactory.

Colored Burl Dyeing

The use of colored burl dyeing solutions, by which I mean reds, violets, greens, etc., was very rarely resorted to, as it necessitated, first of all, fixing a mordant upon the cotton and then dyeing with the basic colors; and this method, particularly when only small quantities of vegetable matter are present, is complicated, costly and tedious. For this reason, as I have already said, colored burl dyes were only rarely employed, and a more or less satisfactory compromise was arrived at by dyeing the burls gray or black.

Passing now to the method of applying the direct cotton dyes, this provides us with a means of obtaining a full range of dyes, capable of being mixed together in any proportion for the production of shades and tones from the palest yellow to a full black, that enable us to dye the specks an identical shade with the bulk of the material, and that are applied in a very simple manner.

The dyeing operation may be readily carried out in the washing machine or even in the milling machine; and, in fact, this is the way which may be generally recommended, as it enables us to work in the small volume of dye solution that is essential or at least advisable in this process. An advantage of the washing machine is that the squeezing of the material through the rollers insures that good penetration which is very desirable.

As the concentration of the dye liquor plays an important part in obtaining consistent and satisfactory results, it is advisable to work with a certain quantity of dyestuff proportionate to the volume of liquor present rather than to work on a definite percentage on the weight of the pieces.

Recipe for Color

A typical recipe is as follows: For every 10 gallons of water take up to 10 ounces of dyestuff, according to the depth of color required; 1 pound of common salt, and 1 to 4 ounces of soda ash. In some cases soap may be found advisable. The quantity of dye solution taken will vary, of course, according to the weight and number of pieces. Sufficient should be used to wet the material thoroughly and have a moderate quantity in the bottom of the washing machine.

The salt acts as an accelerator or assistant in helping the cotton to absorb the dye, and the soda or soap helps penetration and decreases the affinity of the wool for the dyestuff, so helping to keep the wool clear. The use of soap or soda, however, should be kept down to the lowest possible limit. They undoubtedly help to keep the wool clear; but, generally speaking, they restrain the absorption of the dye by the cotton to some extent, and if they are present in excess there may be a tendency to remove some of the color from the dyed wool.

Salt or sulphate of soda or Glauber's salt is essential for the production of the fullest shades. The temperature of the dye liquor should be neither too cold nor too hot. If it is too cold the cotton comes out thin and has a tendency to rub a little, while if it is too hot there is a risk of staining the wool. A temperature of about 100 deg. Fahr. is just about right for the majority of the dyes recommended.

The use of a concentrated dye solution is important, and care should be taken that it is not made too dilute by condensed water being blown in from the steam pipe where open steam is used for heating up. If possible, a drain tap should be fitted just above the main steam valve so that any condensed water in the pipe may be blown off before turning the steam into the machine. The use of a drain tap of this description should, in my opinion, be more generally adopted. In cases such as this, and in cotton dyeing generally, where the use of concentrated dye solutions is desirable, a fitting of this kind permits the use of open

The points to watch, therefore, to insure satisfactory steam pipes instead of the more expensive and less economical closed steam coil.

results are: (1) A concentrated solution of the dye; (2) the addition of common salt or Glauber's salt to accelerate the absorption by the cotton; (3) the use of soda ash or soap, or both together, in order to keep the wool from becoming stained; and, lastly, working at a temperature of not more than 100 deg. Fahr.

The dyes specially recommended for this purpose are:

For Blacks—Chlorazol Black E Extra for burls; Chlorazol Burl Black RMW; Chlorazol Fast Black BK.

Of these, Chlorazol Burl Black RMW gives undoubtedly the best results from the point of view of not staining the wool.

Chlorazol Black E Extra for burls is very largely used, though the wool is slightly tinted when full shades are desired on the cotton.

For Navys—Chlorazol Black BH gives very satisfactory results.

This color may be used in conjunction with Chlorazol Burl Black RMW for dark navys, or with Chlorazol Blue B for light navys.

As a rule, however, unless the number of specks is very large, the black dyes will give quite satisfactory results.

For Light and Medium Blues—Chlorazol Blue B and Chlorazol Sky Blue GW are suitable.

For Greens and Dark Greens—Chlorazol Green B either alone, with Chlorazol Fast Yellow B or Titan Yellow G for Grass Greens, or with Chlorazol Black BH for Dark Greens.

For Browns—Chlorazol Burl Brown AV and Chlorazol Brown M.

These can be shaded as desired for the production of browns of all kinds from tan browns to nigger browns.

For Violets and Lilacs—Chlorazol Violet WBX either alone or shaded with reds or blues.

For Pinks, Reds and Clarets—Chlorazol Fast Pink BK and Benzopurpurines 4B and 10B, alone or in combination with other colors.

For Oranges—Chlorazol Fast Orange D.

For Yellows—The Chlorazol Fast Yellows; Titan Yellows; Chrysophenine.

It should be remembered that all these dyes work together in combination, and it will be seen, therefore, that practically any shade may be obtained by mixing them in suitable proportions.

For the production of a good black, from 6 to 10 ounces of dye should be taken for every 10 gallons of water, and for full shades of the other colors from 4 to 6 ounces will be found sufficient for most requirements.

The pieces should be run for half to one hour in the burl dyeing solution, and then allowed to drain well or hydro-extracted. Rinse well in cold water; the final rinsing is preferably done with water slightly acidified with acetic acid.

The dye liquors are by no means exhausted, and in the case of black liquors particularly they should be kept for succeeding lots, making them up to the required volume by the addition of a fresh solution of the dyes of about the same strength originally used.

Solid Shades

The next section concerns the production of solid shades on woolen goods which contain an appreciable quantity of cotton. This may be effected in one of three ways, and the most suitable method must be left to the discretion of the dyer according to the degree of fastness required.

The first method is probably the simplest, and consists of either dyeing the material in a neutral dye liquor plus salt or Glauber's salt with direct cotton colors, which give a solid shade on wool and cotton, or by using together acid dyes which dye the wool well in a neutral dye liquor, leaving the cotton white or only slightly stained, and direct cotton colors which under the same conditions dye the cotton much more deeply than the wool.

Among the solid dyeing direct cotton colors are the following:

Benzopurpurines 4B and 10B
Chlorazol Blacks
Chlorazol Browns
Chlorazol Fast Yellows B and R
Chlorazol Fast Red 10B
Chlorazol Green B
Chlorazol Orange Brown X
Chlorazol Fast Reds F and K
Chlorazol Dark Green PL
Titan Yellow G
Chrysophenine

These are a selection of direct cotton colors which dye a reasonably solid shade on wool and cotton mixtures.

As for the second series, we recommend the use of B. D. C. Union colors, which are specially selected acid and direct cotton dyes, mixed together in suitable proportions for the production of a complete range of colors from bright yellows to blacks. These save the dyer a considerable amount of trouble and, being reliable, are very largely used.

Correct Procedure

To obtain satisfactory results by the foregoing methods attention must be given to the following points: (1) The use of a concentrated solution of the dye; (2) the temperature at which dyeing takes place must be properly controlled.

The amount of water employed for dyeing should be twenty times the weight of the material; that is, for every 100 pounds of material take 200 gallons of

water. If more water than this is used the quantity of dye must be increased in proportion.

The object of using a dye solution of this degree of concentration is to give the cotton an opportunity of taking up its proper share of color, as in greater dilution the tendency is for the dye to go on to the wool at the expense of the cotton.

The necessity for controlling the temperature is because the *cotton* has a better affinity for these dyes *under* the boil, whereas *at* the boil wool has the greater absorbing power. It will easily be seen, therefore, that by working either under or at the boil it is possible to control the rate of absorption by either the wool or the cotton to a certain extent, and this fact should always be kept in mind when using this series of dyes.

It is, as a rule, essential that the cotton be a little darker than the wool, as this helps to hide the presence of the cotton. For this reason it is advisable to turn off the steam at the end of the dyeing operation and allow the material to work in the cooling liquor, so giving the cotton a chance to absorb more color.

The following is a typical recipe: Enter the material into the cold or lukewarm dye liquor, raise to the boil in half an hour, work at the simmer for half an hour, and then allow to work in the cooling bath for half an hour longer.

This then is the direct method of obtaining solid shades in one bath on mixtures of wool and cotton.

Two-Bath Methods

The second and third methods require two or more baths. In these methods, as a rule, the wool is dyed first, and then the cotton is filled up, or in some cases the order is reversed. When using either of these methods the wool is dyed with either ordinary acid colors, very easily leveling acid colors, chrome colors, etc., according to the degree of fastness required. The cotton is then filled up as previously mentioned in the case of burl dyeing on the washing machine with the colors that have little or no affinity for wool under the conditions I have already stated.

In some cases, where a little allowance is made by leaving the wool just on the thin side, it is permissible to exceed somewhat the temperature stated—that is, 100 deg.—and by heating up to 120 deg., or in some cases 140 deg., it is possible to obtain a considerably greater depth on the cotton; but the wool is then likely to be stained somewhat, hence the necessity for leaving it just thin to allow for this.

Bright Shades

If the wool has been dyed with acid colors which are sensitive to some extent to alkali, such as acid magenta and acid green, it is advisable to omit the use of soda from the dye solution, and in instances such as this particularly the use of a final slightly acid rinsing water is recommended.

When very bright shades are required, the direct cotton colors may be topped with basic colors in a fresh liquor, but this is complicating matters somewhat, though for bright pinks, bright greens and bright violets it is sometimes essential that this method be employed. The basic dyes alone may be used, but the process is troublesome and complicated, as it requires four separate baths and four washings.

The wool is dyed with acid dyes in the usual way, and then mordanted for two to three hours in a 2 to 5 per cent solution of tannin, or it may be left in the tannin all night. Then squeeze or hydro-extract, and without rinsing fix in a cold solution of 1 to 2½ solution of tartar emetic, rinse well, then dye in a cold solution of the basic dye, together with a little acetic acid, rinse again, soap to remove any bronziness on the wool that may be caused by the basic color, and finally rinse.

This method reminds one somewhat of the old method of dyeing a cotton scarlet in wool and cotton unions, where first of all one gave a cold sumac bath, then fixed with tin chloride solution, rinsed off, then dyed in a quercitron bark liquor, washed again, and finally dyed to shade with peachwood.

Except in cases where extreme brightness is required, the basic colors should be used with caution, as they leave much to be desired from the point of view of fastness to light and to rubbing.

A method that is occasionally employed is dyeing the cotton at a low temperature with colors that may be diazotized and developed, such as Chlorazol Black BH or Chlorazol Black SD; the results produced in this way are remarkably fast. The wool is then cross-dyed with suitable acid colors.

Another method is to first dye the wool with fast to milling acid dyes, or mordant dyes, and, after rinsing, dyeing the cotton in a lukewarm bath with the sulphur dyes, in conjunction with glucose or other protecting agent, for three to four hours, then rinsing off and finally souring slightly to prevent any chance of tendering the wool by traces of sodium sulphide.

Lodge Evans Process

There are other methods of producing solid shades on mixed fabrics; for instance, with the sulphur colors the Lodge Evans process gives excellent results, and if care is taken in the working of the process no injurious effect on the wool need be feared.

I might mention the fact that the direct cotton dyes in some cases may be made faster by after-treatment with formaldehyde or metallic salts; for instance, Chlorazol Black E Extra for burls becomes much faster to washing when after-treated with 1 per cent formaldehyde.

This, however, necessitates a fresh solution, and on the whole the simpler process is very satisfactory and the after-treating process need only be considered when extra fastness properties are required.

In conclusion, it is possible to shade the wool in the washing machine if this is found necessary. The acid dyes which have a good affinity for wool in a neutral bath at moderately low temperatures will be found suitable. These will in some cases even work in an alkaline liquor, but in such cases the amount of soda should be cut down to the absolute minimum or omitted altogether.

The Principles of Organization and Management

Importance and Purpose of Organization—Scientific Method for Executives—Need for Understanding Men —Allocation of Functions Among Subordinates—Deputing—Training the Worker—Functions of Management

By WALLACE ATTWOOD

ORGANIZATION is the proper adjustment of the relationship between human beings in an effort to accomplish certain definite ends. The degree to which this adjustment is correct, logical and on sound lines determines the resultant success of the organization. It is animate rather than inanimate. A business is a living, plusating organism, which should function methodically, without confusion, delay or misinterpretation, yet with a flexibility which allows for the initiative of the individual. Good organization implies clearly-defined plans and ideals, and efficient co-ordination and co-operation of capital, labor and management in carrying them out.

Good management will look to the development and direction of the great sources of power in the personnel of the business, so that each member contributes his quota to some constructive plan. The resultant should be the exact control of the business, so that there shall be the maximum of efficiency.

The ideal of an efficient organization is, then, that of man-building. Surely this is high enough; but in order to make the ideal practical of attainment it must find expression through a type of organization which will recognize and apply correct principles, laws and rules.

The Importance of Sound Organization

The evolution of industry and commerce has long since carried us beyond the limitations of the one-man business. Business activities are now extremely complex, whether looked at from the standpoint of a single business or industry, or the interplay between associated industries—national or international. Without proper organization there would be chaos. There is no doubt that the conditions which present themselves so plainly to us in the aftermath of the war will force efficiency in organization and management. We must organize ourselves for action, just as we did during the war. Industrial conditions will not be stabilized by a single influence, but only through the adoption of a program of constructive betterments by each industrial concern.

There is a remarkable lack of knowledge of what we might term "the mechanics of organization." Most organizations are a good deal like Topsy, who "just growed." Capital, labor, management—it is the co-operation of these three, through sound organization, that tends to the greatest success in modern business. Since the flow of influence in an organization is from the top downwards, it is evident that increased efficiency will be most quickly secured by applying efficiency principles in the first place to the personal operations of executors, managers, and so on. It is important, therefore, that the elements of good management must provide for:

1. The systematic use of experience.
2. Economic control of effort.
3. Promotion of personal efficiency.

Coming more strictly to the ideal business organization, we must so construct it that we have—

1. Management and men working in complete harmony.
2. Centralization of functions that group themselves naturally.
3. The Line of Control, Authority, and Responsibility, operating from executives downwards—avoiding (a) divided authority, (b) duplication, (c) bottle-necks, (d) blind alleys, and (e) breaches or misfiring.
4. No man responsible to more than one superior for the same function.
5. Pyramidal support from the bottom upwards.
6. Co-operation and co-ordination interdepartmentally.
7. Elasticity which will allow for the expansion of the business.
8. A line of progress which will allow for the growth and initiative of the individual.
9. The three-positional plan whereby each person is (a) carrying out his own work, (b) training the man below him, and (c) understudying the man above him.
10. An organization which will give expression to the personality of the business.

The Purpose of Organization

When an efficient organization has been created in a business, department, or section, we may expect it to—

1. Co-ordinate all the functions of the business to one end—that of rendering efficient service to the community we are seeking to serve.

2. Keep the business in touch with all outside developments.

3. Define clearly the functions of each activity within the business.

4. Carry out the clearly defined policy and ideals of the business.

5. Give scope for every individual in the business, and, by expansion, to create openings for further helpers.

6. Give the square deal to Capital, Management, Labor and Customer.

The Scientific Method for Executives

To be properly organized, a business must be run on scientific lines. It is important, therefore, since the organization is no stronger than the combined efforts of the individuals composing it, that each person—and more especially the executives—must carry out work by scientific methods. Business activities to-day demand exactness and standards by which to measure achievement. Such standards must cover the individual, the products, the methods, and the working conditions. The scientific method calls for an inquiry into the ratio between practical accomplishment and theoretical effort.

The executive must—

1. Set standards for every unit in the organization.

2. Plan all work intelligently; in general, for long periods ahead, and down to the minute detail, for early accomplishment. Then stick to the plan.

3. Prepare all working conditions so that every facility is available for the successful accomplishment of the work to be done.

4. Compile accurate records with a view to confirming work done and as assistance for future activities.

5 Limit the amount of detail work for himself, thus leaving him free to control, analyze, and supervise the work of others under him.

6 Make known where the responsibility and authority of those under him begins and ends.

7. Standardize the duties of his subordinates and place these duties in the hands of those competent to handle them.

8. Organize his work so that his absence for a time will not be felt.

9. Work always on the law of exception, investigating good work to praise and inefficient work to remedy defects.

10. Build always on a firm foundation. Have a positive knowledge of each task.

The Need for Understanding Men

Men who know how to get the maximum results out of machines are common; the power to encourage the maximum from subordinates is a much rarer possession. But when we deal with men we are confronted with a complex problem. Even when we have made a study of psychology, or the laws governing mentality, we have in each individual to deal with his temperament and his personality. Executives should seek every opportunity to study mankind in general, and in particular the men under them. It is one of the main functions of the executive to discover the aptitude of each individual under his care, and see that he obtains a certain versatility in the duties given to him which will bring out his aptitudes. At any rate, these aptitudes must be discovered and developed. We cannot afford the economic loss due to wasted man power. It is not fair to the man, the business of the country. In a sense, he has a right to look to you to help him discover himself. Each worker must be happy. You must understand his weaknesses, and watch out for the trouble he may cause. Encourage his good points and deal with his faults. The whole essence of the art of management lies in the proper understanding and the proper dealing with men.

Allocation of Functions in the Subordinate Positions

Having sized up the organization at your command, your best step will be to consider the functions for which you are responsible. Where an executive occupies a position which is subordinate to that of the head of the branch, then his next step will be to confer with his head and obtain a clear understanding as to the particular functions for which he will be held responsible. He will then be in a position to allocate such functions to himself and to his subordinates in accordance with the organization under his control.

In this allocation of functions and duties you should bear in mind the following points:

1. Avoid the undue concentration of duties or authority at any one point.

2. Have in mind the average man who will have to carry out these duties, and do not put on too great a load for the average man to carry.

3. Arrange for the hardest tasks to be taken care of as well as the easiest.

4. Make it possible for duties to be performed in a way that will yield the greatest returns in the shortest time.

5. Each subsection, group or branch should be so arranged as to contain all the factors which will effect the performance of its particular functions. Only in this way can each subordinate be held strictly responsible for the successful accomplishment of the tasks allocated to him. In addition, this greatly reduces the amount of supervision required, and also tends to develop and strengthen the subordinates.

6. Allocate the functions so that you are in a position to deal with any task in its elementary parts rather than in large units.

Deputing

By preparing very carefully the foundation of the organization, personnel, etc., you have a clear course as to how much is to be deputed, who would carry the load for you, how this would be carried out, the points at which you can check up accomplishment, and so direct the energies of your subordinates. In deputing, endeavor to keep your subordinates as far as possible on the highest kind of work of which they are capable. In giving orders or instructions, see that you amplify them, giving the reason for which the work has to be carried out, so that you arouse interest in the worker and give him ground for self-respect in accomplishing the task. Encourage him to take pleasure from his work, as it gives him an outlet for his energies and an opportunity to demonstrate his mastery over the task.

Naturally, you will have an objective in all your plans. Let your subordinates know what your objective is. See that the juniors get versatility in the tasks which are handed out to them, so that they may broaden their experience in the department's work. The evolution from the junior to the executive is that he should "first learn something of everything and then learn everything about one thing."

Develop the habit of letting go your detail work. Occasionally, have a sort of "spring clean" with regard to your daily work; ask yourself why you are doing certain tasks and if there is anyone among your subordinates who could be trusted with it. Remember that you are expected to keep the reins in your hands. You have authority over your subordinates, and in final analysis must take the responsibility for the work with which you entrust them. See always that you keep at least 1 per cent of anything that you depute in your own hands. Remember that work is most easily controlled at its origin and checked at the pivotal points or at completion. Orders or instructions communicate authority from you to those under your charge. Reports on accomplishment discharge the responsibility of a subordinate to you. Arrange for information to come through automatically, rather than as a result of your own personal effort in collecting it. Don't let work drift along at the comfortable level of the average mind.

The principle that authority and responsibility should coincide is often lost sight of. Responsibility cannot be developed in individuals unless they are given specific authority. Obviously, responsibility for good or bad accomplishment cannot be fixed unless the authority be clearly defined and responsibility made to coincide. Inability to fix responsibility clearly and justly for acts that have already taken place is without doubt one of the greatest enemies of organization.

Train, Direct and Supervise

A point is ultimately reached in the expansion of any business when the personal relations that existed between the master and the man no longer obtain, and these must be replaced by organized effort. Business men are fast waking to the fact that the greatest problem that confronts them is the man problem. This has been brought home more forcibly in recent times because—

1. We are passing from an industrial period where the greatest economies have been effected by labor-saving devices to one where human ingenuity is necessarily devoted to a finer organization of business.

2. We are realizing that mechanical invention economies cannot proceed indefinitely, nor can the utmost values be obtained therefrom without dealing with the human factor in whose hands the economies are really effected.

3. We realize that an organization is an organism pulsating with energy that needs direction.

4. We appreciate the principle that man is the cause of which all else in industry is an effect, and that the success of any business is no greater than the sum of the successes of the people in it.

5. Investigation has proved our general ignorance of the content and potentiality of the human factor.

6. We find too great a turnover of workers, much of which is due to our lack of appreciation of the versatility of human talents, to the lack of adequate training and proper employment plans.

7. Of the great upheaval brought about by the war and its attendant circumstances.

8. Much of the present unrest, in final analysis, is due largely to the maladjustment incident to subordinating one human will to another, especially when it is accompanied by work conditions which tend to repress the development of the human personality.

Executives are continually complaining of the meager equipment and indifferent attitude of the juvenile recruits towards work, and the consequent large turnover and instability of workers, resulting in a serious lack of highly skilled workers and a shortage of competent men for the posts of full responsibility. To-day industry must not bear the cost of human depreciation but assist in preventing it. We must, therefore, create the best possible work environment for discovering and training human aptitudes. Industry is continually looking for ability. Industrial training, vocational guidance and scientific management are but successive phases of the same problem—which is to make every member of the organization an efficient industrial and social unit. The problem, then, is to develop the man, and the supreme function that of the conservation of human energy.

Training the Worker

This question of training is but a part of the larger question of vocational guidance, which implies the proper

selection of employees and the training and application of their talents. It forces us to comprehend the physical, intellectual and moral worth of each worker. It calls for readjustments in education and work opportunities that will establish, maintain, advance and defend individual freedom, and thus enable a man to make the most of himself. Work environment profoundly affects the welfare of all people. Work is the chief training school of life. Training is the means by which fitness is most quickly and easily acquired. Vocational guidance should be, as far as possible, a matter of self-direction, through the creation constantly by the executive of the right kind of opportunities. Workers are entitled to direction and training in addition to their weekly wages. Each individual, as he proceeds through life, has continually to be making choices as to the best direction in which to apply his energies. He needs health, income, progress, sociability and opportunity for wholesome constructive leisure, and in these democratic days it is all-important that he should have his sense of justice satisfied.

The significant influence of the rise of the human factor in business relations is seen in many directions—(1) in the distracted and torn conditions in which society finds itself to-day; (2) in the conflicts between capital and labor; (3) in the dissatisfaction among business men with our educational output; (4) in the discontent in the educational sphere with what industry has to offer to the workers; (4) in the grave criticisms coming from without, because of the social burdens forced upon society by the unemployed—created in large part because they were first misemployed, then underemployed, then unemployed, and finally made unemployable; and (6) at the same time the increase of wealth, the spread of all forms of education, the growth of political democracy, and expanded freedom in many directions have vastly enlarged the horizon of the worker.

The Objects of Training

In training the men under your control, you should bear in mind constantly that you have to develop heads as well as hands. Routine workers must perforce have to deal with tasks which are beneath them in quality, but you must show how, by intelligent thought, even routine work can be made a problem of method. Encourage each worker to entertain a just respect for his work. Keep accurate records of performances by workers. Familiarize each worker with the quailties which you consider ideal for his job; then inspire him to strive for their development and attainment. Study each worker in relation to his task, and find out the causes of his success or failure. Praise the former and give constructive criticism with regard to the latter. You must help the worker to think, to be orderly and logical in his processes of thought, to be accurate in his observations and disriminating in judgment.

Get ideals for your staff. Develop departmental pride, but let it conform to the ideals of the business. Get some soul into the work and develop teamwork. Awaken the consciousness of service whereby each realizes that all good work satisfies the wants of others.

Let there be an observance of the spirit as well as the letter of the rules which govern business relationships. Encourage each person to think, feel, and work on the positive side of life. The future and not the past is always the banner to float before aspiring workers.

Opportunities for the worker must be created. See that workers are not overlooked or overworked. Make it possible that there shall be nothing between a man and success except himself. Make sure that the man most capable and efficient in a certain kind of work will get that work to do. Development of character is most important so that each worker may the better be able to engineer his life to greater happiness.

Direction and Supervision

The executive must fill his own position properly before he can expect to have the substance of authority rather than the mere shadow which his position gives him. Real authority comes in a large measure from actual knowledge of the functions, activities, duties and tasks over which the executive exercises control. The big work for executives is not that which has to do with factories, plant, manufacturing, figuring or merchandising, but that of man building. You will get bigger returns for the time and effort spent in developing your workers than the same time and effort spent on the inanimate things of business. Take up the study of man, and commence with yourself. Train yourself to get down to the level of each individual under you. Start from his viewpoint, and, working from this, bring him round to the business viewpoint, which, on right foundation, should mean finally the best interests of the man himself. The object of all training should be to increase the usefulness of the worker—usefulness to himself and others.

Functions of Management

Some executives work incredibly hard, live a strenuous life and never have a minute to themselves. Time and energy are dissipated over little things. Such an executive is continually answering the demand of a disorganized business. He is at the beck and call of everyone with whom he deals, each supplied with a weapon of the executive's own forging which is being used against himself. This is one of the most harassing positions in which an executive can find himself. The true executive is gauged by his ability to control, judge, plan and execute. Sound judgments and correct decisions are the keynotes of the test. The executive's job is primarily a thinking job; he is dealing with forces rather than with things or systems. The business man of small caliber knows little or nothing of these fundamental forces. Business is becoming increasingly more exact, more scientific and therefore more professional. I have endeav-

ored to show that organization and management can be based on laws and principles, causes and effects. Business management is a profession. Extraordinary as it may seem, business is the only profession that a man can enter without previously preparing himself for it. A man cannot become a doctor, a lawyer—he cannot even become a stone mason or a carpenter—without previous preparation. But he can slip into business no matter how inadequately prepared he may be in the science of business. Real executive power will not just come to a man—he must study and train himself for the position.

Administration is a "thinking" job. The true executives of to-morrow and of the future are going to direct more and more on the basis of scientific knowledge rather than on the basis of tradition or precedent.—"The Journal of the Textile Institute."

THINGS EVERY TEXTILE CHEMIST AND COLORIST SHOULD KNOW

(*Concluded from page* 42.)

increased affinity for colors is probably due to a partial oxidation of the fiber.

Chlorinated wool may also be produced by the following process:

For 100 pounds of wool, either in the loose state or in the form of yarn, treat as follows:

First enter the material for half an hour in a cold bath containing 1½ pounds concentrated HCl per 10 gallons of water. Then squeeze gently and work in a bath made up as follows: 18-24 parts of bleaching powder and 400-450 parts of water.

The bleaching powder solution when made up should have a strength of between 0.6 and 1 deg. Tw.

After working in the above bath for half an hour, add to the same bath 3 ounces HCl per 10 gallons of bath and work for another ten minutes.

Then re-enter into the first acid bath, to which has been added 8 ounces of HCl per 10 gallons of bath, for fifteen minutes, and then wash thoroughly in cold water. If after the final washing a decided smell of chlorine is still perceptible, it is advisable to treat the material for another fifteen minutes in a bath containing 5 per cent (weight of wool) of sodium thiosulphate at 86 deg. Fahr. and rinse again.

The chlorinated wool is then ready for use and, if woven with ordinary scoured yarn, will produce a plain cloth which will give a two-color effect when dyed. For instance, if dyed with a blue dye so much dye will go on the chlorinated wool as to make it almost a blue-black, while the ordinary wool will only be dyed a very light blue.

The same is true with many other dyes. If a black is used the result will be a deep black and gray.

Unshrinkable Woolens

So-called unshrinkable woolen underwear is prepared through the chlorination of the wool. The material is alternately treated with sodium hypochlorite solution and hydrochloric acid, and finally thoroughly washed and treated in a solution of sodium bisulphite. The latter treatment is to remove the last trace of chlorine and restore as far as possible the original color.

One objection sometimes advanced to the use of this process is that the material so treated absorbs moisture too readily and in too large quantities. This property may be overcome to a considerable extent by a final treatment with lukewarm ammonia solution, followed by drying.

The durability of the material is also reduced somewhat by this treatment.

CASH COMPARISON OF CHROMATES

No doubt many of us often debate from the buyers' viewpoint the relative values of potassium and sodium bichromates as mordants. Apart from the dyer's problem as to what produces the best dyeings, the question of relative weight-for-weight efficiency can best be solved by the chemist in concert with the costs clerk.

Potassium bichromate contains no water of crystallization; sodium bichromate 12 per cent; neutral sodium chromate 52 per cent when freshly crystallized, but it is sometimes sold dried, when it is practically anhydrous. Thus it is necessary at the beginning to put a sample into the drying oven and ascertain its percentage of molecularly held moisture.

By comparing the chemical activities of these mordants we find 294 pounds of potassium bichromate is worth 298 pounds of ordinary sodium bichromate, and that each of these is worth 684 pounds neutral sodium chromate together with 98 pounds cent-per-cent sulphuric acid. If the neutral sodium chromate is anhydrous, 324 pounds of it with 98 pounds B. O. V. (approximately) satisfies this equation of values. These figures are chemist's, arrived at from molecular weights.

Thus, if sodium bichromate costs 1s. per pound, neutral sodium chromate with 52½ per cent crystallized moisture should be worth only 5¼d. per pound (reckoning in the acid at about 1d. per pound). Anhydrous neutral sodium chromate should sell at 11¼d. on the same basis.

Neutral sodium chromate is very efflorescent, losing water during storage unless it has been sold as dried. Thus, in the avaluation of a delivery the above typical figures would need some adjustment if the percentage of moisture proved appreciably less than 52½ or appreciably more than zero.

It should be remembered that in using neutral chromate, sulphuric acid is needed to turn it into the ordinary bichromate, the proportions being given above. The quantity of acid (98 pounds to 324 pounds an-

hydrous chromate), excessive though it may seem to the dyer, is quite indispensable, and must be added to the neutral chromate before the usual percentage (if any) of acid as calculated on the weight of material to be dyed is entered.

A working formula becomes convenient, a rule of thumb which can be revised after drying tests are made on samples. For neutral chromate the rule becomes:

1. For every 10 pounds potassium or sodium bichromate used before, use 11 pounds anhydrous neutral sodium chromate and add 3 pounds 6 ounces best B. O. V. Then add your usual amount of acid for chroming.

2. For every 10 pounds potassium or sodium bichromate used before, use 25 pounds ordinary crystallized neutral sodium chromate and add 3 pounds 6 ounces best B. O. V. Then add your usual amount of acid for chroming.

The neutral chromate should give exactly the same results as bichromates if used according to the above recipes, but whether sodium or potassium bichromate is better is another matter. Sodium bichromate is more easily dissolved; that is in its favor. Also its price is lower. But for wool one may argue that, since potassium is less foreign to the raw material than is sodium, potassium bichromate should give the "gentler" results. Still, it is merely an oxide of chromium which forms the ultimate mordant; a point which discounts the last suggestion to some extent. At any rate, sodium bichromate gives satisfactory results in daily use. Facilities of procuring one salt or the other vary in particular localities and may affect comparative prices.—"Posselt's Textile Journal."

The New Protective Agent for Animal Fibers

An Interesting Account of the Properties and Applications of "Protectol," Which Is Exciting Some Comment Abroad, as Presented in a Paper Before the Manchester Section, Society of Dyers and Colourists, Together with a Discussion of the Product as Printed in the "Journal" of the Society

By ALFRED EDGE

THE cleansing or scouring of wool by means of soap and alkali is a delicate operation, and inexact or careless manipulation may easily result in serious deterioration of the valuable raw material. A means of avoiding this danger has now been placed on the market by the Actien Gesellschaft fur Anilin Fabrikation of Berlin under the names of "Protectol, A.G.F.A.," Nos. 1 and 2. These new preparations possess the useful property of protecting animal substances, such as wool, silk, leather, furs, or the human skin, against the injurious effect of alkalis.

They are marketed in the form of brown syrupy liquids of 62 and 48 deg. Tw. respectively, possessing a neutral reaction and ready solubility in water. No. 1 is precipitated by alkaline carbonates and is intended for use with caustic alkalis (soda, potash or ammonia). No. 2 protects against alkaline carbonates or sulphide of soda. It has therefore a wider field of usefulness than No. 1 in the treatment of textiles, furs, and leather.

In wool scouring, in order to obtain thorough saponification or emulsification of the grease, the temperature of the scouring liquor must be above the melting point of the wool fat (105 to 108 deg. Fahr.), and when the scouring is carried out at between 110 and 120 deg. Fahr., some damage to the fiber always results, particularly in the case of the finer grades of wool.

The addition of Protectol to the scouring bath makes it possible to keep the temperature above the melting point of the wool fat, without danger to the material properties of the fiber.

The quantity to be added varies according to the quantity of alkali present, and the temperature of the bath. As a rule half as much Protectol as soda ash is sufficient to afford complete protection.

Protectol may also be used with advantage in the scouring of piece goods, both all wool and, more especially, unions. It is specially useful in the treatment of pile fabrics, such as plushes and astrachans, where injury to the animal fiber may easily occur.

Dark colored rags may be treated with sulphide of soda in presence of Protectol, and thus a much lighter colored material obtained than when stripping with soda alone.

Vat Dyeing

An obvious application of the new product is in the dyeing of wool with vat dyes in the hydrosulphite-caustic vat. The difficulty of obtaining satisfactory results with this vat has been the chief obstacle in the introduction of this class of dyestuffs for the dyeing of wool.

This application of Protectol has been very thoroughly investigated, and its use is attended with many advantages. The wool is thoroughly protected against the injurious effect of the alkali; a better exhaustion of the bath is noticed, and a superficial fixation of the color is prevented. No alteration of the method of working the vat need be made; the addition of Protectol varying from 1/3 to 1½ ozs. per gallon, according to the depth of shade required. It is to be noted that when using Protectol, the oxidation takes place somewhat more slowly.

The Use of Protectol in Union Dyeing

There has, up to the present, been no suitable method of applying the sulphide dyes in sulphide of soda solution in the dyeing of union piece goods. By using Protectol with sulphide colors the wool is only slightly stained, and may be afterwards cross dyed with acid, metachrome or after-chroming dyes. This gives a result which is superior in fastness to anything that can be obtained by the single bath method, or by wool dyeing and burl dyeing. It is of great interest for expensive union materials, such as gabardines, when the utmost degree of fastness is essential.

It is advantageous to dye the sulphide color in as short a bath as possible, and the most successful results have been obtained by dyeing on a jigger. The color may be applied by the usual sodium sulphide process, but the best results have been obtained by reducing with hydrosulphite. This may also be carried out in the jigger.

After dyeing, the goods are washed—acidified with sulphuric acid and again well washed, afterwards wool dyeing in the winch machine with metachrome or other chroming dyes.

The process is also very well adapted for woolen piece goods which contain vegetable impurities, cotton burls and "shives," which may be dyed on the jigger with sulphide dyes. When the burls are well covered, the goods may be wool dyed by the metachrome or after-chrome methods.

The one-bath method of union dyeing has the disadvantage that the goods are liable to form crimps and winch marks, and frequently do not handle well, the cloth being what is known as "boardy" in feel. This is due to a deterioration of the wool or shoddy, and makes the process unsuitable for the more expensive and delicate union fabrics, such as plushes, astrachans, and luster goods.

The use of Protectol has been found to be a practical means of overcoming the drawbacks associated with this very convenient and economical method of dyeing, particularly in garment dyeing, for which the one-bath method is very well adapted.

With certain dyestuffs which are readily precipitated from their solutions by acids, it is necessary either to use neutral dye baths or baths containing ammonium salts, which decompose on boiling and set acid free gradually.

It has been found that Protectol prevents the precipitation of such dyestuffs by acid, and they may be dyed with acetic acid if Protectol is added to the bath. The process has been thoroughly worked out in the case of the Indocyanines, a very useful class of dyestuffs possessing exceptional fastness. This new process may be used for all colors which require to be dyed with sulphate or acetate of ammonia.

A patent has been applied for covering the use of Protectol in the dyeing of chrome colors, either by the after-chroming, metachrome, or chromate methods. An addition of 2 to 4 per cent Protectol to the dye bath has a very remarkable effect on the spinning qualities, softness, and elasticity of the dyed wool or shoddy—the effect being specially noticeable in the case of the latter material—and more level results are obtained.

Silk

Many attempts have been made to substitute soap in the degumming of silk, but the processes hitherto suggested have not met with much success, either because the silk fiber is affected, or the process offered no advantages over the old method of "boiling off" with soap. By the use of Protectol it is now possible to rapidly and safely degum raw silk in a caustic alkaline bath without the slightest risk of damage to the fiber, and with great saving in steam and labor.

The treatment is carried out by treating for one hour at 100 deg. Fahr. in a solution containing 1 to 1½ oz. caustic soda and 1½ to 2 ozs. Protectol per gallon, afterwards rinsing and lightly souring.

By means of Protectol it is also possible to dye silk with the sulphide dyes in a sulphide of soda bath, the dyeing being carried out at a temperature of 140 to 170 deg. Fahr. in the case of color, and for blacks up to 190 deg. Fahr.

In the treatment of cotton and silk fabrics, a preliminary treatment with caustic soda is given in some cases in order to increase the affinity of the cotton for dyes. This is usually carried out with caustic soda of about 40 deg. Tw. When Protectol is used there is no shrinkage of the cotton during the partial mercerization, but the increase of affinity for dyes is still obtained, and the silk is degummed without injury to the fiber.

In the dyeing of half-silk with sulphide dyes, various effects may be obtained by a proper regulation of the temperature. Dyeing at 20 to 25 deg. Cent. the cotton only is dyed, and if the temperature is raised to 70 to 80 deg. Cent. solid shades may be produced. By dyeing at the lower temperature with suitable acid colors added to the bath, a two-colored effect is produced. The use of Protectol renders it possible to carry out these processes without fear of injury to the fabric.

Furs

Very satisfactory results have been obtained by the use of the new product in the treatment of furs. It is usually unnecessary, in order to obtain satisfactory results in dyeing, to subject the furs to an alkaline treatment known as "killing." The object is to make the hair more receptive for the dye—particularly the tips of the hair, which would otherwise take the dye poorly—and to remove the natural grease. Superfluous tannin is also removed by the treatment.

Protectol has given excellent results in practice when used with the "killing" liquors. No. 1 is used where killing is done with caustic soda, ammonia or milk of lime, and No. 2 when the process is carried out in the "Tumbler" with soda solution.

The process generally employed with small skins is to

brush onto the hair a solution of caustic soda (¾ to 3 deg. Tw.) containing Protectol, leave overnight, and then wash well.

The dye bath, when using fur dyes of the Ursol class, is frequently alkaline. Protectol in this case prevents injury by the alkaline liquor and also against the oxidizing action of the hydrogen peroxide without influencing the dyeing process.

Leather

In the leather industry, Protectol has been found to give beneficial results in the "liming" process, which is now frequently carried out with sulphide of soda. The object of this treatment is to loosen the hair, but there is risk of damage to the skins.

It has also been used in the dyeing of chamois leather with sulphide dyestuffs, which are exceptionally well adapted for this purpose. The alkalinity of the dye bath is again a drawback, and the addition of Protectol is found to give an effectual protection.

In dyeing with basic dyes on chrome leather, in order to make the leather receptive for these dyes it is necessary to treat it with a tanning agent. It has been proved that Protectol can be successfully employed instead of sumac or gambier. The leather is treated in the tumbler with 15 per cent of Protectol II for half an hour, then rinsed, and the dyeing with basic colors follows.

In the dyeing of feathers highly satisfactory results have also been obtained.

It is the intention of the Berlin Company to place on the market a brand of Protectol in the solid form, which will have many times the protective effect of the two existing brands, and by reducing the cost of carriage—at present a serious item—will make its use possible for even the cheapest class of goods.

Discussion

The Chairman (Prof. E. Knecht) said that apparently the substance acted as a protective colloid, with a selective action.

J. R. Hannay asked whether, when Protectol was used, union goods could be dyed with sulphide dyes on the ordinary type of jig in which the top rollers were outside the liquor. If that was possible it would be interesting to see whether Protectol would give similar results with cotton piece goods. Mr. Edge stated that, in giving certain union goods a preliminary partial mercerization, the addition of Protectol to the bath had the rather surprising result that there was no contraction of the cotton fiber though the mercerization was quite as effective as when the fiber contracted in the usual way. If this was not simply due to the straining effect of the interwoven animal fibers, it was obvious that by the use of Protectol they could mercerize cotton and not contract it; which would save a great deal of trouble in many processes.

The lecturer said that the union goods were dyed cold in the ordinary type of jig. He could offer no explanation for the curious behavior of the silk and cotton goods where there was no shrinking of the cotton, and still the increase in the affinity for dyes was quite the same. It certainly appeared worth while to investigate the possibilities of the phenomenon in the mercerization of cotton.

P. G. Jones referred to the Lodge Evans process where sulphide of sodium was turned into sulphide of ammonia, and asked whether the Protectol was cheaper to use than the other process. With regard to the dyeing of cotton goods on the jig, such as sulphide blues, which were known to be very apt to bronze and become dark colored, did the use of Protectol obviate this?

The lecturer said that the Lodge Evans process was one for applying sulphide dyes to wool. In the case under consideration they were only aiming at dyeing the cotton, and did not want to dye the wool at all. It was what was known as burl dyeing, not dyeing the whole fabric.

Mr. Jones said it was quite usual to dye the cotton in half-wool goods by the Lodge Evans process, and afterwards dye the wool in an acid bath.

William Thomson inquired whether Protectol could be used in conjunction with strong alkaline soap. Would it prevent the irritation to the skin which was caused by the barium sulphide used as a depilatory?

The lecturer said that it could be used in connection with barium sulphide. It was possible to put the hands in caustic liquors containing Protectol without injury. He did not know that it has been used in connection with soap, but he thought it was a very likely and advantageous method of using it. He had used Protectol up to a temperature of 180 deg. Fahr. for scouring wool, and there was no deteriorating effect at that temperature.

Replying to C. Doxey, he did not know that Protectol had been used on a practical scale in the printing of sulphide dyes on wool and silk fibers.

N. B. Maurice asked whether a satisfactory explanation could be given of the action of Protectol. In the boiling-off of silk, particularly crepe de chine, which contained fast boiling colors in the stripes, the boiling-off usually required six to eight hours, but by adding Protectol and a small amount of caustic soda to the bath, he found that the time for boiling off was greatly decreased. If it was possible to cut down the time for boiling to one or two hours, and at the same time dye the silk previously with sulphide colors instead of vat or mordant colors, there would be an enormous saving in labor and in cost.

The lecturer said that he had brought the paper forward with some reluctance, as he was not at liberty to disclose the nature of the substance dealt with. Great interest had been taken in it on the Continent. He could not state what its composition was until the patent came out.

Smith & Drum, Philadelphia, Pa., report sales of dyeing machines for the first four months of this year as more than double those for the corresponding period last year.

AMERICAN
DYESTUFF REPORTER

Devoted to the use and application of dyestuffs and the mechanical equipment incidental thereto.

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DRIFTING

IT will be remembered that at the very outset of the World War it was the British, partly because their position and experience enabled them to see clearly and partly because their language made it possible for them to make use of the American press more freely than could any other race, who were among the first to point out to us—as well as to put us on our guard against—that subtle and mighty power, German propaganda.

Persistently was the message driven home, until at length the American public came to know this propaganda for something far more than a phrase with which to adorn patriotic after-dinner speeches, but instead for what it really was, a serious and well-nigh ineradicable menace, not only to certain of our industries but to our very national unity.

By the time this country itself was caught up in the European maelstrom of destruction, Americans understood the meaning of German propaganda very well indeed. The effort begun by the British had been taken up by numerous individuals and organizations in the United States, and the light had been spread with a thoroughness which precluded all who were not wilfully blind from seeing the truth. So well was this work done, in fact, that the final stages of the conflict saw the start of the seemingly inevitable reaction to all such educational movements as soon as they have been carried past a certain point. It is human nature to laugh at and make sport of a much-feared thing which has been rendered harmless, and it is undeniable that the phrase "German propaganda," being by that time so well understood that it was considered to have been robbed of all menace, at length made its way onto the vaudeville stage and into the comic weeklies. It was a true instance of a villain having been apprehended and publicly unmasked—and then, rightly enough no doubt, laughed at. German propaganda, as a liability, was practically written off, and he who sought to use the phrase save as banter came to be looked upon as either an alarmist or an ass.

Nor should it be thought this feeling toward what had once been a danger was confined exclusively to the habitually frivolous-minded. Many among even our more serious thinkers imagined that since German propaganda had become so well understood that it was unable longer to threaten our safety, it would do no particular harm if the populace at large chose to add it to their list of "sure-fire" mirth provokers. And so, apparently, the majority of them were lulled into the belief that German propaganda could never do us any harm again.

Such a condition of mind, while it could not well have been avoided, is a dangerous one to fall into.

Germany could have asked no better field for the sowing of a fresh crop of propaganda than this country presented some months after the conclusion of the war. Propaganda, we take the liberty of pointing out, never became a joke to Germany. She rightly continued to regard it as an unequaled trade weapon. It was no passing experiment, no fad of the moment, with her. Its use was and is to-day a settled world policy. She understands the disguising and application of it as well as any nation and better than most, and to those who may imagine that because she was once exposed it would be folly for Germany to resume her efforts to influence trade conditions in her favor, we can only say that obviously it would be a far greater folly for her to abandon them. Those engaged in the American dye industry, however, are not among those thus deluded.

Before going any further, let it be understood that the war is over and that The REPORTER, which acknowledges priority to none in advocacy of the elimination of international jealousies and the restoration of normal feeling, does not seek to revive a former bitterness. This propaganda, therefore, is not being attacked because it is *German* propaganda, or French or English or any other kind of propaganda, but because it is *anti-American* propaganda.

To resume, we know that recognition of its form and presence is fatal to propaganda of any kind. But it is likely to prove a very serious thing if those at the head of our Government, having come to understand one phase of German propaganda, should have succeeded in persuading themselves that they understand the whole of it. When detected, propaganda becomes practically impotent, and therein lies the trap for those who say, "I see none now." Of course they don't. If they did, it would no longer exist, and you may be sure that Germany understands this and is taking good care that her present methods are not being recognized for what they are. We cannot impress this fact too clearly upon readers of The REPORTER.

When one country enters another for the purpose of inaugurating pro-German or pro-anything propaganda of a nature calculated to injure the industries of

that country, it must count on its efforts being detected by at least a few individuals. Thereafter it depends upon the personal influence and abilities of those individuals, and likewise upon how successfully the attacking country can suppress or discredit those individuals, whether or not the alarm is thoroughly given and the propaganda set at naught. But it will be seen that the task of the individuals will be far easier in a country which has not yet learned to belittle and laugh at such a subject than it will where propaganda has come to be made the butt of cheap humor.

We do not pretend to be so astute as to say authoritatively just how the German agents here are working against America's coal-tar chemical industries, nor who they are. Nor is it necessary at the very outset of a campaign against them to be able to do so. It will suffice for the time being to issue a very solemn warning against them.

He who will observe may know they are here. When a series of results begins to manifest itself—results which exactly coincide with those which the I. G. would bring about by fair means or foul if it could, and in spite of all efforts on the part of patriotic Americans to prevent them—no further evidence, we take it, is necessary.

Such results have been appearing with great and increasing frequency of late, and again we charge the doubters and the scoffers to observe the dye situation during the next few months and be convinced. Those who fail to be, will not want to be.

The United States, rich and prospering, is rapidly drifting into a state of complacency which makes her an easy mark for the lean and desperate legions of Mitteleuropa. Are we to be so unutterably asinine as to allow them to take away from us what we were at so much pains to build? Unless action of some sort is taken, and the proper authorities aroused to the danger, they will assuredly have our dye markets, and, furthermore, they will have control of our dye industry as they did when American dye works were mere assembling plants.

Again we say, study what is taking place in England and Italy, and study the movements in the dye controversy on this side of the water, and stop blissfully joking about German agents and their abilities.

Correspondence

BOILING FIBER IN CONCENTRATED SULPHURIC ACID

July 11, 1922.

To the Editor of The Reporter:

In the issue of July 3 of The Reporter, the writer has read the answer given C. W. S. on page 30 and will state that it seems more care should be given in the publication of such prepared answers.

The idea of boiling any fiber in concentrated sulphuric acid and expecting it to withstand the treatment is absurd.

Perhaps the small globule mentioned shows the presence of silk rather than cotton.

Elmer C. Bertolet,
Philadelphia Textile School.

Review of Recent Literature

Principles and Practice of Fur Dressing and Fur Dyeing. William E. Austin, B.S., 184 pp. and index; 6x9; boards; illustrated. New York, D. Van Nostrand Company. $4 net.

This work is intended for a twofold purpose, the first being that it may serve as a textbook for those who expect to make fur dressing and dyeing their vocation. The fundamental principles upon which the industry is based are discussed in the light of the most recent chemical and technical developments, and the most important operations are treated fully and systematically, and are illustrated with practical examples.

The second purpose is to serve as a practical handbook for the worker in the fur dressing and dyeing plant. The latest factory processes and methods are described, and numerous working formulas given. The formulas are all such as have been successfully used on a large scale, and give satisfactory results when applied under the proper conditions. It is also believed that the book will prove of interest to chemists and to students of industrial chemistry, since it furnishes an introduction into a field of applied chemistry but little understood outside of the industry.

The author points out that the great increase in the use of furs during the past few decades has caused the fur dressing and dyeing industry to rise from relative insignificance to considerable importance as a branch of applied chemistry. The past eight years, moreover, have witnessed the virtual transference of the leadership in the dressing and dyeing of furs from Europe to America, and in the quality and variety of products the domestic industry is now in every way the equal of, and in many respects superior to, the foreign. The great bulk of American furs which formerly were sent to Leipzig, Paris or London to be dressed and dyed, are now being dressed and dyed in this country.

In spite of these facts, very little is generally known about the nature and manner of the work constituting the dressing and dyeing of furs. Even among members of other branches of the fur trade there is very little accurate information on the subject. Real knowledge concerning fur dressing and dyeing is possessed only by those actually engaged in the industry. The interest and efforts of scientists and technologists have been enlisted to only

a small extent in the technical development of the industry. The reason for this may be attributed to two related causes: First, the almost monastic seclusion in which fur dressers and dyers, particularly the latter, conducted their operations, and even to-day the heavy cloud of mystery which is being dispelled but very slowly; and second, as a consequence of the first, the lack of any reliable literature on the subject. Of the few books which have been written on the industry of fur dressing and fur dyeing (all of them either German or French), most are hopelessly out of date, or contain no trustworthy data; or, if they do have real merit, cannot be obtained.

As for the contributions of the technical journals, the author summarizes his opinion of these and perhaps administers a deserved rebuke with the succinct statement: "Numerous articles . . . are of interest, but they contain very little information of value."

It is this very real gap, then, in our literature on the subject of fur dressing and dyeing that the author seeks to fill in the present work. That he has done so no one will be prepared to deny after a perusal of it. As it stands, the volume is singularly complete, and owing to the combination of circumstances mentioned above, may be regarded more or less in the light of a pioneer which we trust will attract followers in future.

Contents include: Furs and Their Characteristics; Structure of Fur; Fur Dressing: Introductory and Historical; Fur Dressing: Preliminary Operations; Fur Dressing: Tanning Methods; Fur Dressing: Drying and Finishing; Water in Fur Dressing and Dyeing; Fur Dyeing: Introductory and Historical; Fur Dyeing: General Methods; Fur Dyeing: Killing the Furs; Fur Dyeing: Mordants; Fur Dyeing: Mineral Colors Used on Furs; Fur Dyeing: Vegetable Dyes; Fur Dyeing: Aniline Black; Fur Dyeing: Oxidation Colors; Fur Dyeing: Coal Tar Dyes; Bleaching of Furs; Bibliography.

Yarn Printing Machines. C. Alvord in British Patents No. 175,310, 1922, and No. 175,584, 1922.

Inventor states that in printing yarn intended for the manufacture of carpets, plush, etc., jacquard and other mechanical attachments are proposed in place of manual control over the positioning of the cylinder. The jacquard mechanism automatically controls the distances between identical color impressions on the yarn. It is also used to place a movable yarn carrying support in proper position for printing.

Mechanism is also provided for moving the color car, which carries a submerged revolving coloring roller. A special arrangement has been found necessary for automatically stopping the color car while the drum is being turned.

Where two consecutive color prints blend, a blur or ridge is usually formed. In the present invention such ridges are eliminated automatically by the action of scraper mechanism which is caused to obey the movements of the color car.

A further specification relates to an improved color scraping attachment controlled by jacquard mechanism. A cut-out device is provided in order that the scraper may be allowed to function only in those cases where two stripes of the same color come together.—E. C. in "Jour. Soc. Dyers & Colourists."

Foreign Trade Opportunities

Reserved information may be obtained from the U. S. Bureau of Foreign and Domestic Commerce and its district and co-operative offices by duly registered firms and individuals upon written request by opportunity number. The Bureau does not furnish credit ratings or assume responsibility as to the standing of foreign inquirers; the usual precautions should be taken in all cases, and where no references are offered it does not necessarily imply that satisfactory references could not be given. Correspondence may be in English unless otherwise stated. Symbols: *Reported by American consular officers; †Reported by commercial attaches and trade commissioners; ‡Direct inquiries received by the Bureau.

2789.*—A manufacturing firm in Sweden desires to purchase all materials and articles necessary for the manufacture of perfumery, soaps, chemicals, oils, dyes, machines and apparatus. Quotations c. i. f. Goteborg. Payment to be made against documents in Swedish bank. References.

2865.*—Mill owners in southern India wish to secure agencies for the sale of metals, hardware, rosin, aniline and alizarine dyes, chemicals, paper, enameled ware, paints and varnishes, stationery, etc. Quotations c. i. f. Indian port. References.

2618.†—The representative in the Dominican Republic of an American firm desires to secure an agency for the sale of men's shirts, neckties, ready-made clothing, hats and caps, hosiery and dry goods. Quotations, accompanied by samples, are requested. Reference.

2619.*—A manufacturing firm in Sweden wishes to purchase machines, yarns and trimmings suitable for tricot factory. Quotations should be given c. i. f. Swedish port. Terms: Cash on arrival of goods in Sweden. Reference.

2750*—A commercial agent in Sweden desires to secure the representation of firms for the sale of textiles and sporting goods. Quotations c. i. f. Swedish port. Reference.

2847.*—A mercantile firm in Norway desires to se-

cure an agency for the sale of hosiery, in artificial silk, pure silk, cotton (plain and mercerized), in black, white and colored. Quotations f. o. b. American port. Payment to be made through banks in Norway and New York. References.

2772.*—Firm in England wishes to purchase and secure an agency for artificial silk hosiery, at prices ranging from $2 to about $7 per dozen pairs. Quotations c. i. f. Manchester. Reference.

2774.*—A mercantile firm in South Africa desires to secure an agency for the sale of a complete line of boots and shoes of the best quality, for men and women; and also high-grade stockings for women. Quotations c. i. f. South African port. References.

2775.*—Firm of importers in Belgium desires to secure an agency for the sale of raw cotton of the best quality. Quotations c. i. f. Belgian port. Tercs: Cash against documents. Reference.

2768.*—A manufacturing firm in Sweden desires to purchase cotton in quantity of about 2,500 bales per year. Quotations c. i. f. Swedish port. Terms: Cash against documents. Reference.

2721.*—A firm in Germany wishes to purchase plating for harness and riding equipment in lacquered iron, brass and German silver in large quantities; and jute cloth, bagging, and hess yarns. Quotations c. i. f. German port. Terms: Cash against documents. Reference.

2724.*—An agency is desired by a firm in India for the sale of kerosene and petroleum products, lamps, iron and steel, hardware, paper, dyes, chemicals, pictorial and art goods, cotton yarns and piece goods, and sundry articles. Quotations c. i. f. Indian port. References.

2729.†—Agencies are desired by a merchant in Cuba for the sale of textiles, silks and knit goods in general. References.

2686.*—An import company in Canada wishes to secure an agency for novelties, patented articles, shirts, men's neckwear and hosiery. Quotations desired f. o. b. Canadian port. Reference.

2687.*—An agency is desired by a firm in Spain for the sale of paints and colors, chemical products, foodstuffs and tinfoil. Quotations c. i. f. Spanish port.

2688-2710.*—Owing to the lack of space, a number of "Foreign Trade Opportunities" pertaining to textiles have been grouped by the Bureau and can be obtained by referring to the opportunity numbers given.

Recent Patents

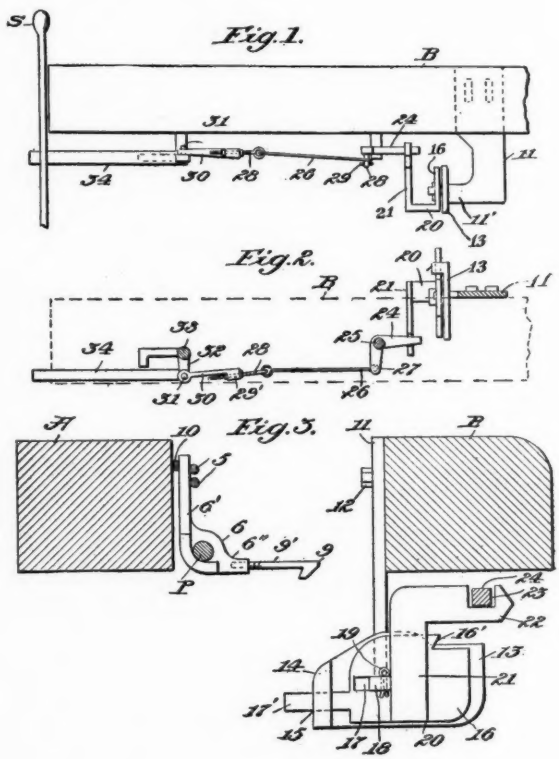
Stop Mechanism for Looms

(1,410,831; March 28, 1922)

JOHN B. OUELLETTE, New Bedford, Mass.

Relates to an improved stop mechanism for looms and has as its object the provision of certain improved features in a stop mechanism of the type disclosed in inventor's co-pending application, Serial No. 307,591, filed June 30, 1919.

In the application above referred to there is disclosed a stop mechanism comprising a kicker pivotally mounted upon the protector rod of a loom adapted to operate means upon the breast-beam which is connected to the loom shipper-lever. The kicker is normally held in inoperative position, but is moved to position to actuate the shipper-lever operating means when the shuttle are in certain defective and undesirable positions.



The present invention has as one of its objects the provision of an improved kicker device which is provided with a toe adapted to engage the shipper operating means upon the breast-beam, the toe being adjustable toward and from the breast-beam to accommodate the mechanism to looms in which the throw of the lay varies.

Another object of the invention is the provision of im-

proved operating connections between the shipper-lever and the member which is actuated by the kicker. In the co-pending application the mechanism is shown as comprising a bracket secured to the breast-beam, this bracket having located thereon a slidable member which is connected by means of a lever to the shipper. In employing this stop mechanism it has been found desirable to place the bracket which supports the slide in various positions along the breast-beam. In some looms it may be found desirable to locate this bracket immediately adjacent the shipper, while in other looms, due to the proximity of the temple and other parts of the loom, a different position must be selected for the bracket. Hence, it is desirable that the connection between the kicker operated member and the shipper be adjustable in length to adapt the same to any selected position for the bracket supporting this member.

Fig. 1 is an elevational view of the breast-beam of a loom showing improved mechanism applied thereto.

Fig. 2 is a bottom plan of that portion of the mechanism shown in Fig. 1; and

Fig. 3 is a vertical sectional view taken through the breast-beam and lay of a loom and showing the relation between that portion of the device supported upon the lay and the mechanism shown in Figs. 1 and 2.

Referring to the drawings more in detail, A indicates the lay of a loom and B the breast-beam, the lay being provided with the usual protector rod P which is shown as having thereon for pivotal movement the kicker 6 which has a vertically extending arm 6′ and a horizontally extending arm 6″. The kicker is normally movable about the protector rod by means of a spring 10 located between the vertically extending arm 6′ and the lay. This movement is prevented is prevented by means of the ends 5 of rock shafts, the opposite ends of which are located adjacent the shuttle boxes, except when the shuttle positions are defective.

The kicker shown in the drawings is provided with a toe 9 having a shank portion 9′ which is adjustable in the end of the arm 6 of the kicker, the shank being threaded for this purpose. By adjusting the shank of the toe in the kicker arm, it may be moved toward and from the breast-beam and thus be suitably positioned and adapted to satisfactory co-operation with the particular loom upon which it is positioned and with the remainder of the mechanism supported upon the breast-beam B.

The breast-beam has secured to one face thereof a vertically extending bracket arm 11 as by means of a bolt 12, and this arm at its lower end is provided with a laterally extending portion 11′ which terminates in a substantially rectangular plate 13 having at its rear end a lug 14 formed with an opening 15 therein. Supported upon the face of the plate 13 is a slide 16 having an elongated slot 17 therein through which extends a lug 18 upon the plate 13. A cotter pin 19 may extend through the pin 18 to prevent accidental displacement of the slide 16 from the lug 18. The upper edge of the slide 16 is cut away as at 16′ to form a shoulder adapted to be engaged by the kicker toe, and the end of the slide may be formed with a tail piece or guide finger 17′ extending through the opening 15. From the lower edge of the slide 16 extends an arm 20 which is formed with an upwardly extending portion 21 paralleling the face of the slide 16, and the upwardly extending portion 21 terminates in a rearwardly and laterally extending arm 22 formed in one edge with a recess or seat 23.

The invention is characterized by the provision of an operating connection which is adjustable in length between the slides 16 and the shipper-lever S of the loom. Such a connection is shown in the drawings and comprises a bell-crank 24 pivotally supported at 25 adjacent the slide so as to be removable and adjustable in position so that it may always be located adjacent the slide. One arm of the bell crank extends into the recess 23 of the slide arm 22, and to its other end is removably connected a link 26 which has a looped end 27 fitting around a pin 28 at the end of the bell-crank. A cotter pin 29 may be passed through the pin 28 to prevent the link from accidentally falling from the bell-crank. The other end of the link is similarly connected to an eye bolt 28 adjustably threaded in an eye 29′ of an arm 30 which has a pivotal connection 31 with a bell-crank 32 supported beneath the breast-beam at 33. The other end of the bell-crank 32 engages the dagger 34 pivotally supported in the usual manner upon the breast-beam, and adapted to engage and actuate the shipper-lever when operated through the connection with the slide 16 above described.

From the above description it will be understood that when there is danger of collision between shuttles upon the raceway by reason of the presence of a shuttle in a box at each end of the raceway, the shafts 5 will be rocked to permit the kicker to pivot about the protector rod P and to bring the toe 9 into engagement with the shoulder 16′ of the slide 16 upon the forward or picker motion of the lay. As the lay moves backwardly, the toe of the kieker carries the slide rearwardly or to the left as viewed in Fig. 3, thus swinging the bell-crank 24 about its pivot and through the link connection shown causing movement of the dagger 34 and of the shipper-lever.

In applying the stop mechanism disclosed to a loom, it will be understood that the slide supporting bracket 11 will be placed in any desirable position along the breast-beam, adjustment of the eye bolt 28 permitting variation of the distance between the bell-crank 24 and the bell-crank 32 in conformity with the selected position of the bracket. It will also be understood that should it be found necessary to place the bell-crank 24 at any less or greater distance from the bell-crank 32 than is permitted by merely adjusting the eye bolt, the link 26 will be removed and a longer or shorter link substituted therefor.

Process of Expanding the Cross-Sections of Spun Silk Yarn

(1,413,193; April 18, 1922)

Seiichi Sakane, Kamikyo-Ku, Japan.

This relates to a process of expanding the cross-section of a spun-silk yarn by countertwisting the said yarn and steaming it. It has for its object to make

elastic and soft woolly yarn of spun silk. The expression "spun silk" is used here in a broad sense; it is used to mean not only ordinary silk that is spun but those of mandarin silks, Japanese oak silks, Chinese oak silks and the like. Silk yarn containing cotton or woolen portions may also be profitably treated by this new process.

To describe further, to treat twisted single yarn it is at first heated in dry or wet state for twenty or thirty minutes, so that the curling of silk fibers in the said yarn may be made permanent. Where the yarn has been already heated in a previous treatment, such, for instance, as bleaching, scouring or dyeing, so that the curling of the silk fibers has become permanent, the preparatory treatment above described may be dispensed with.

The yarn thus treated after being dried is then countertwisted by any suitable twisting machine in order to untwist about a half or one-third of the total number of twists of the yarn. After untwisting, the silk fibers of the yarn become separated one from the other, thereby expanding the cross-section of the yarn.

Next the yarn is reeled on a swift and made into a hank by any suitable means, such, for instance, as by winding it loosely on a pair of parallel bars. The hank is then steamed so as to prevent the yarn from retwisting, but is left free to shrink. In about five minutes of steaming, the silk fibers are permanently set in their separated condition and, consequently, the cross-section of the treated yarn gets larger and the yarn becomes elastic, soft and woolly. It looks like woolen yarn, but is more lustrous.

Doubled yarn may be treated in the same way. When it is steamed and countertwisted, the single yarns of which the twine is made and the silk fibers in the single yarns respectively separate themselves from one another, thereby expanding the cross-section of the doubled yarn. The single yarns and their fibers are permanently set in separated condition in a succeeding steam treatment.

Instead of the preparatory steaming and untwisting in the process of above mentioned, another method may be used for doubled yarn. Single yarns, of which doubled yarn is to be made, are first twisted in a required number of filatures, and then they are twined by a doubling machine so as to produce a number of twists corresponding to about half the number of the filatures. For example, when two single yarns of spun silk yarn of 120-ply are to be doubled, the number of twists or filatures of the single yarns is 472 per meter in the metric system, while the corresponding number of twists is 425 per meter. In the present method, the number of twists is reduced to about from 200 to 300 per meter, so that the tendency of the single yarns to further twist is the same as when a twisted yarn is untwisted by the method first described. The succeeding treatment—that is to say, steaming—should be done next. The same result may be attained by this modified method as by means of that first mentioned.

Cloth Tinting Composition and Process of Tinting Cloth

(1,412,014; April 4, 1922)

CARLETON ELLIS (assignor to Ellis-Foster Company, Montclair, N. J.).

This relates to a process of treating the lining of automobile tops and relates especially to a method of spraying a tinting composition on such linings and to a composition adapted for such tinting purposes.

The invention is concerned especially with the revival or renewal of the linings of automobile tops such as the ordinary touring car top, which has an outer fabric of leather or leather substitute and an inner lining of cloth which is usually loosely attached to the outer covering. The inner cloth lining very quickly becomes weather stained and streaked from water and dust and becomes unsightly. While the outer fabric may be treated with leather dressings to restore its appearance, heretofore there has been no satisfactory way of reviving the interior or lining.

According to the present invention, in its preferred form a solution is made in a hydrocarbon solvent of a dye which is soluble in such solvent but insoluble in water. The oil soluble dyes now on the market and used in varnish stains may be employed for the purpose. They are sold under various names and are readily obtainable. Ordinarily it is preferred to use a stain which gives a brown, drab or mahogany tint. It is desirable to have the solution strong enough in dye to adequately cover the water stains of the fabric. It is also desirable to have present a small amount of resin to better hold the dye in place and to serve to slightly brighten the fabric. On the other hand, it is undesirable to use a heavy bodied varnish basis or anything of this description because it renders the fabric stiff and also may lead to spontaneous combustion when the top is closed and the lining is folded and pressed together.

For this reason it is preferred to use approximately a 2 per cent solution of a resin as a binder and brightener. However, the proportion of resin may be varied from less than 2 per cent to 10 per cent and upwards. Between 2 per cent and 8 per cent satisfactory results are obtained. The resin is calculated on the weight of solvent employed. The resin also serves to some extent as a waterproofing agent, so that when cloth so treated is again exposed to rain water stains do not form as readily.

A suitable solvent vehicle is benzol or toluol, but preferably varnish painters' naphtha or heavy benzine is used. A mixture of benzine and benzol may be employed.

The proportion of the oil-soluble color may be approximately 1 per cent, but may vary more or less according to the intensity of the tint desired.

A suitable composition is made by dissolving 2 per cent of cumaron resin in a solvent composed of 90 per cent of varnish makers' naphtha and 10 per cent of benzol and adding a mixture of one part of oil-soluble orange stain to two parts of oil-soluble oak stain, the proportion of oil-soluble dye in this case being 1 per cent. This gives a brownish tone with a slightly reddish tint which quite effectively covers the weather stains on the fabric.

If such a composition were applied with a brush it would be difficult to make even application, but by means of spraying the composition may be applied uniformly. However, if a sprayer does not work properly and drops of the composition fall on the fabric, the resulting blot is difficult to cover by subsequent coats of the composition as applied by spraying.

It is possible to apply the spray to the cloth from the underside when the cloth is in a horizontal position, as, for example, in its normal position in the automobile top.

One feature of the invention, therefore, is that of spraying a composition of this character in a substantially vertical position against the fabric, thereby overcoming the danger of not securing a uniform application. Hence it is possible to treat the fabric in the automobile top without its removal from the machine.

Other resins or binders such as shellac, ordinary rosin, rosin ester and drying oils such as linseed oil, wood oil, etc., may likewise be used in some cases. However, a resin which is substantially unaffected by water—that is, does not turn white or change in appearance on contact with water—is preferred.

Other mixtures may be used which have a waterproofing effect, as, for example, a solution of paraffin or, better, ceresin wax in benzol or toluol. This is tinted with the oil-soluble dye. Two or three per cent of wax suffices to secure desirable waterproofing results, but the wax may be increased if desired. Noninflammable solvents, such as trichlorethylene or carbon tetrachloride, may be used.

Ordinarily a quick drying composition is desired, as the fabric is preferably quite thoroughly wetted with the solution and with slow drying materials present the lining would require a protracted exposure in order to render the fabric perfectly dry. By the use of small quantities of resin in this manner a binding effect may be secured without the employment of drying oil.

Other solutions such as alcoholic solutions of dyestuffs which are insoluble in water may likewise be employed, but as a rule do not give as satisfactory results. It is also possible to spray a water-soluble dye, as, for example, an aqueous solution of a dyestuff on the fabric, and subsequently treat with a mordant or fixative. However, the present process, involving the use of a dilute resin solution containing an oil-soluble but water-insoluble dyestuff and sprayed vertically against the fabric, accomplishes very satisfactory results at a low cost and with a simplicity of operation which is desirable. The top does not have to be removed from the body of the car in order to treat it. This preferred method, therefore, is recommended for the majority of automobile top linings.

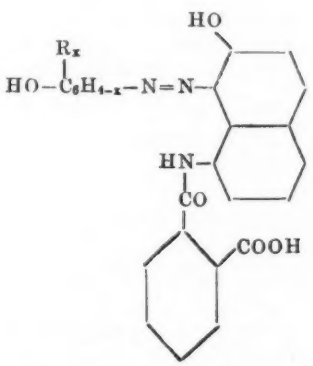
Azo Dye

HUGO GELDERMANN and FELIX MEYER, Dessau, Anhalt, Germany (assignors to Actien Gesellschaft fur Anilin Fabrikation, Berlin, Germany).

Relates to new azo-dyes deriving from a non-sulphonated substitution derivative of diazotized 2-aminophenol and 1.2'-carboxybenzoylamino-7-oxynaphthalene obtainable by heating molecular proportions of 1-amino-7-oxynaphthalene with phthalic anhydride in low-boiling indifferent solvents such as benzene. They correspond to the general formula:

R meaning one or two substituents such as a halogen atom or the nitro group or an alkyl group.

These new dyes when dyed in the presence of an



alkali-metal chromate and an ammonium salt such as ammonium sulphate furnish on wool olive tints of an excellent fastness to milling.

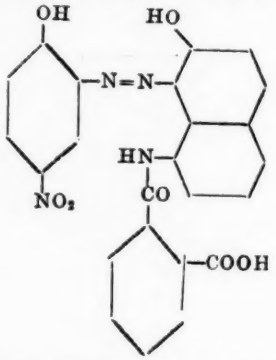
The dyes in the shape of their dry pulverized sodium salts are dark powders soluble in water with a violet color and soluble in concentrated sulphuric acid to bluish red solutions from which on addition of ice the dye is precipitated in the form of reddish flocks. By strong reducing agents they are destroyed yielding a 2-aminophenol substituted in the nucleo and 1.2'-carboxybenzoylamino-8-amino-7-oxynaphthalene.

In order to illustrate how the new dyes may be manufactured, without limiting the invention, the following example is given, the parts being by weight:

Example: 15. 4 parts of 4-nitro-2-aminophenol are diazotized in known manner by means of hydrochloric acid and sodium-nitrite. Then the diazo compound is added to a solution of 31 parts of 1.2'-carboxybenzoylamino-7-oxynaphthalene maintained alkaline by sodium carbonate. When the combination is complete the dye is salted out, drained and dried. Its constitution in the free State is expressed by the formula:

Its reduction products are 2.4-diaminophenol and 1.2'-carboxybenzoylamino-8-amino-7-oxynaphthalene.

Similar dyes are produced if the 4-nitro-2-aminophenol is replaced in the equivalent proportions by another 2-animophenol derivative for instance by 4-chloro-, 4.6-di-



chloro-, 4.6-dinitro-, 5-nitro-4-methyl-, 5-nitro-4-chloro-, 4-nitro-6-chloro-, 6-nitro-4-chloro-2-amino-1-oxybenzene.

Process of Disintegrating Vegetable Fibers for Use in the Textile and Paper Industries

(1,410,069; March 21, 1922)

CHARLES MORIONDI, Nanterre-Paris, France (assignor to Societe Anonyme des Brevets Peufaillit, Lille, France).

This relates to improvements in the process of disintegrating vegetable fibers for use in the textile and paper industries. The object of the improvements is to provide a process by means of which the fibers are disintegrated into finely divided form in which they are readily ground for use in the manufacture of paper, and by means of which foreign matter is thoroughly removed and a product is obtained which is particularly suitable for the spinning process. With these and other objects in view, the invention consists in using certain agents for disintegrating the vegetable fibers which have heretofore not yet been used, and which are hydrocarbons containing chlorine. Such agents are the following:

Dichlorethylene (sym.)	$C_2H_2Cl_2$
Trichlorethylene	C_2HCl_3
Perchlorethylene	C_2Cl_4
Tetrachlorethane (sym.)	$C_2H_2Cl_4$
Pentachlorethane	C_2HCl_5

These agents may be used either separately or as a mixture of a plurality thereof for treating fibrous materials.

In order that this process be more clearly understood, an example embodying the same is given:

One or more of the above-named agents are added to water or a liquid which is suitable to produce an emulsion, such, for example, as diluted soap solution, oily emulsion, or the like. In carrying out the process, water containing 3 per cent of petroleum has given good results.

After the liquid has been thus prepared, the fibrous material is added thereto and heated within a closed vessel at high temperature.

The amount of the agents used in the process is different according to the character of the fibrous material. In ordinary cases up to 10 per cent by weight of the material to be treated can be used. Also the temperature and the time during which the material is subjected to the process are different. In some cases it will be advisable to treat the material under increased pressure, which pressure is likewise different according to the nature of the materials to be treated and the results aimed at.

The most favorable conditions are in each case determined according to the nature of the fibrous material, the age of the same, and the time which has elapsed after the materials have been harvested.

Production of Pattern Effects in Cotton and Other Vegetable Fiber Fabrics, Including Silk

(1,411,598; April 4, 1922)

RICHARD SMITH WILLOWS, Manchester; FREDERICK TOMLINSON POLLITT, Worsley, and THOMAS LEACH, Manchester, England.

The present invention relates to improvements in the production of pattern effects on cotton and other vegetable fiber fabrics and also including silk hereafter termed textile organic fabrics.

The object of the invention is to obtain certain delicate yet clearly defined effects.

It is of course, common to produce pattern effects by embossing fabrics either in the dyed or undyed or mercerized or unmercerized condition by subjecting the fabric to the action of suitable embossing means, usually a heated roller upon which there is a pattern in relief. In view of the fact that subsequent treatment with water is capable of partially or completely nullifying the effect of the embossing which appears to be either in the direction of compression of the fiber or change of its state of hydration, it was to be expected that the delicacy of such patterns would be seriously impaired if not destroyed by subjecting embossed fabrics to the action of dyeing solutions.

It has, in fact, been proposed to mercerize a fabric and to emboss this fabric while in the wet state and thereupon to dye the embossed fabric. Study of this proposal in practice demonstrates, however, that the edges of the pattern are blurred and that the desired delicate and sharply defined pattern cannot be obtained in this way; it may be noticed that this proposal only extended to mercerized materials and not to unmercerized materials.

It is the object of the present invention to overcome this disadvantage and this result has been successfully achieved by employing the following steps in combination, viz:

1. Conditioning the fabric so that it contains from about 5 to 15 per cent of water, i. e. fabric containing the amount of water common to air-dry or slightly moist condition. This conditioning may be performed either

by damping the dry fabric or by drying the damp fabric or by selecting the fabric at the right stage of dryness. (This amount of moisture is critical since if "wet" fabrics are used, blurred effects are obtained.)

2. Embossing a pattern on the conditioned fabric by suitable embossing means.

3. Subjecting the embossed fabric to treatment by a dyeing or a mercerizing or parchmentizing agent, either single or in combination.

These three steps are essential, and if they are all applied it will be found that a delicate yet well-defined pattern will be obtained on the dyed or mercerized or parchmentized fabric. If uniform compression is used, a uniform sheen is imparted to the fabric after step 3.

Thus a fabric of cotton or other vegetable fiber, flax, jute, ramie or nettle, or also a fabric of silk may or may not be treated with any of the usual processes preparatory to dyeing such as scouring, bleaching, mordanting, creping or mercerizing or parchmentizing and is then damped or dried until it contains 7 to 15 per cent of water as determined by drying for one hour at a temperature of 212 deg. Fahr.

The conditioned fabric is then pressed, e. g. under a heated embossing roller or plate bearing the desired pattern or design in relief.

The embossed fabric is then dyed and may be finished by any of the usual processes incidental to this operation for instance calendering, printing, embossing, mercerizing, schreinering or raising. In some cases the dyeing may be replaced by operation such as mercerizing or parchmentizing. The essential point of this third step is that the fabric is treated with some reagent whereby a differential effect is produced so that a pattern results. In other words, one can cause fixation of the pattern by the use of a suitable chemical reagent such as the dye or parchmentizing agent or other agents. By parchmentizing after embossing, plain cotton fabrics may be caused to resemble brocade. The designs or patterns so produced are not only clearly defined when made but remain clearly defined through all processes to which the fabrics are likely to be submitted in laundering, or other cleaning processes to which the fabric or articles made therefrom are likely to be submitted in or after use.

The fabrics prepared as described are characterized by the feature that although the relief caused by embossing has disappeared, i. e. the pattern is in one plane, yet the moisture content per unit area is different in the parts of the fabric forming the pattern and the background. This difference is due to the application of pressure and heat during embossing and it persists after the further treatment described.

"Attack Well Timed," Says Garvan of Political Raid on Chemical Foundation

Head of Organization Indicates Prospective Legal Battle to Retain Patents Demanded as Result of German Intrigue

"INCIDENTALLY, it might be mentioned that the question of the German chemical embargo comes up in the new Tariff bill on July 12, and this attack is well timed," was one of the significant comments of Francis P. Garvan, president of the Chemical Foundation, Inc., when apprised of President Harding's action in requesting Alien Property Custodian Miller to demand the return of the seized patents controlled and administered by that organization.

"America's best legal minds, including several stanch and true Harding Republicans," continued Mr. Garvan, "approved the Chemical Foundation's title to the 4,700 German chemical patents it bought from the Alien Property Custodian, and on that united opinion 150 of the biggest chemical concerns of the country invested $150,000,000 for the development of the patents for market in in this country.

"I am proud to claim credit for being the founder of the Chemical Foundation. This is not the first time it has been attacked. The Germans have been quite active with their propaganda, and their campaign is to get those patents back so that they can once more control the entire dye market and a large part of the rest of the chemical market and the billions of dollars in American industry that are dependent on dyes and other chemicals."

Government Demands Return of Seized German Patents

The action which called forth these statements, and which, coming from a clear sky, astounded the dye industry and has provided the main theme of conversation in chemical circles during the past fortnight, consisted of instructions issued by President Harding that a demand be made on the Chemical Foundation, Inc., for immediate return to the Government of all patents, trade-marks, copyrights, contracts and other property transferred to it by alien property custodians of the Wilson Administration.

The instructions, contained in a letter written by the President to Thomas W. Miller, Alien Property Custodian, which was made public at the White House, were

wholly unexpected, although the Chemical Foundation has been repeatedly under the fire of Republican members of Congress.

In addition to the instructions that a demand be made for return of the assignments made by the Alien Property Custodian's office under the previous administration, the President ordered Mr. Miller to take any action advised or approved by the Attorney General to respect fully the rights or interests of the United States Government or any of its agencies in the propertes turned over to the Chemical Foundation.

Supplementary to the President's letter a statement was made by Attorney General Daugherty that the action taken by Mr. Harding was "justified by the records" of the Department of Justice, which he said had for many months been conducting an investigation "in the face of much interference." The Attorney General added that the instructions as to the return to the Government of property taken over by the foundation would be carried out "with all dispatch."

Harding's Letter to Miller

The letter of the President to Mr. Miller, made public at the White House after Attorney General Daugherty had been in conference with the Executive, follows:

"My attention has been called by the Department of Justice to the fact that a corporation, known as the Chemical Foundation, has brought suit against the Treasurer of the United States and certain licensees of the Federal Trade Commission for an accounting alleged to be due the said Chemical Foundation on royalties due it for the use of certain patents originally seized under the authority of the Alien Property Custodian and sold to the Chemical Foundation by the custodian during the previous Administration.

"On the face of such an action it became so apparent to me that an inquiry should be made that I asked for a report by the Department of Justice on the sale of such enemy property to the Chemical Foundation.

"It appears that the sale was made at so nearly a nominal sum that there is reason to believe that this Government has not faithfully observed the trust which was implied in the seizure of this property. The circumstances relating to the entire transaction are of such a character that full investigation becomes a public duty. Moreover, I feel that your office is obligated to maintain the sacred character of the trust to which the Alien Property Custodian is intrusted by law.

"You are thereby directed to proceed forthwith as follows:

"1. Make written demand upon the Chemical Foundation, Inc., in form to be approved by the Attorney General to immediately return, transfer and assign to the Alien Property Custodian all patents, trade-marks, copyrights, contracts, applications or other properties or rights transferred to it by the Alien Property Custodian as aforesaid, and to account to it for any and all rents, profits, license fees or other other proceeds thereof realized by said Chemical Foundation, Inc., from said property or rights or any of them from the date of transfer thereof, to the Chemical Foundation, Inc., to the date of restoration.

"2. Take any other action which may be advised or approved by the Attorney General by suit or otherwise to fully and in every way respect the rights or interests of the United States and any other person or corporation interested therein, in and to the properties and rights aforesaid and any proceeds, income or profit therefrom in the hands of the Chemical Foundation, Inc., or its officers, agents or employees.

"In carrying out these instructions you will act upon the advice of the Attorney General."

Daugherty's Statement

Attorney General Daugherty in his statement said:

"The President's instructions with respect to the return to the Government of the property taken over by the Chemical Foundation will be carried out with all dispatch.

"After many months of investigation by the officials of the Department of Justice, and in the face of much interference, the point was finally reached when it was possible to make a report to the President.

"The action taken by the President is justified by the records of this department.

"The investigation was in progress by this department for many weeks. It will be continued and the necessary successive steps to carry out his instructions will be taken. The investigation into this case proceeded most expeditiously, in view of the vast number of records examined and the widely scattered location of the various properties and witnesses. This is all that the Department of Justice can say about the case at this time."

"Would Destroy Organic Chemical Industry"

On learning of the pending demand, Mr. Garvan said:

"President Harding's communication to Attorney General Daugherty calls for nothing less than the destruction of the organic chemical industry in America. This industry has been built up by the investment of $150,000,000 of American capital in the assurance of freedom from German control, which the transfer of these patents to the Chemical Foundation guaranteed.

"This action was taken without notice to the American organic chemical industry or to the Chemical Foundation or to any of its officers or to, in fact, any one equipped to speak for the essential American industry, in peace or war. It has been taken, I am informed, after a full hearing of the representatives of the German cartel, the German dye trust and the German Government and without opportunity being given for any American interest to be heard in reply.

"Many investigations have shown that not one dollar of indivitual profit or gain has ever accrued to any individual connected with the foundation.

"Attorney General Daugherty says that 'after many

months of investigation by the officials of the Department of Justice, and in the face of much interference, the point was finally reached when it was possible to make a report to the President.'

"What sort of investigation was this? What interference was made? We did not even know that there was an investigation. We would have been glad to place all we had at the disposal of the investigators.

"The charge has been made that the Alien Property Custodian could have realized at least $10,000,000 for the patents for which the Chemical Foundation paid only $250,000. That is only a half truth, and as such is dangerous.

"First of all, let me tell you that only sixty-eight of the 4,700 patents are making any return to the Chemical Foundation.

Could Have Got More by Selling to Germans

"We could have sold at least one of those patents for $100,000,000 if we had wanted to revert back to the same conditions as when Germany held control. There is salvarsan. There are 10,000,000 persons, according to the latest figures, suffering from the disease treated by that chemical here in America.

"Before the war the Government paid $1.50 a dose to the Germans for that chemical. To-day six companies holding licenses from the Chemical Foundation are making it and selling it to the Government at 16 cents a dose. The German product cost the doctors of this country $3 a dose. To-day it costs the doctors 60 cents a dose.

"We could have sold all of the patents that way probably and received much more than $250,000, and then we could have seen them resold into German hands once more and the products returned back to the Fatherland, so that the United States would have to pay through the nose.

"We formed the Foundation to foster the American chemical industry. We have done that. The Du Pont interests alone invested $15,000,000 in plant and research for the development of the patents for which they hold formulae. The 150 companies that hold licenses have invested at least $150,000,000 in that way.

"Those companies did not go into this thing blindfolded. They consulted counsel—the best to be had—and our titles to the patents were scrutinized. They passed muster. All I have to say is that the Chemical Foundation will keep possession of those patents until the last one runs out seventeen years from now."

If Relinquished, Patents Could Not Be Regained, Says Palmer

Soon after it became known that the demand for the return of the patents would be made, former Attorney General Mitchell A. Palmer issued a statement which is worthy of more attention than it received in the daily press. Mr. Palmer said:

"It is a great shame that the war and its lessons should be so soon forgotten. If these patents are recovered from the Chemical Foundation they cannot be again sold to American citizens, and the inevitable next step will be a return to their former German owners. We will then be back to the old days where we were at the absolute mercy of the German dye trust. I doubt if that is the kind of return to normalcy which the American people want.

"Before the war Germany controlled the dye and chemical industry of the world, with all its by-products in the line of medicines, explosives and gas. When the war broke, we were entirely without dyestuffs and the civilized world was in imminent danger from the German scientific knowledge and economic control of explosives and gases. Germany built up this control by her systematic violation of the spirit of our patent laws. She took out American patents, not for the purpose of developing an American chemical industry, but to stifle it.

"These patents were seized by the Alien Property Custodian under authority of the Trading with the Enemy Act. We had no means of determining their actual money value. There was no American chemical industry to aid us in fixing it. If we had sold them to private interests, we might have sold them for greatly less than their value and got nothing but a new American monopoly to take the place of the German trust. So we conceived the plan of conserving them for the general public benefit and to build a great American industry free from the evils of monopolistic control."

Miller's Formal Demand

The formal demand for the return of the patents, delivered to Garvan by special messenger from Washington, was as follows:

"Alien Property Custodian, Arlington Building, Vermont Avenue and H Street, Washington.

"To the Chemical Foundation, Inc., a corporation organized and evisting under the laws of the State of Delaware, 81 Fulton Street, New York City, N. Y.

"I, Thomas W. Miller, Alien Property Custodian, duly appointed, qualified and acting under the provisions of the act of Congress approved October 6, 1917, known as the Trading with the Enemy Act, and the amendments thereto and the proclamations and executive orders issued pursuant thereto, and acting upon the express direction and instruction of the President of the United States of America, do hereby demand and require that you forthwith and immediately return, transfer, assign and account for to me, as Alien Property Custodian, all patents, trade-marks, copyrights, contracts, applications on other properties or rights which have heretofore at any time been assigned, transferred, or in any manner delivered, or pretended to have been assigned, or in any manner transferred or delivered, or which have been enumerated, designated or in any manner described in any transfer or assignment or in any pretended transfer or assignments to you by the Alien Property Custodian, a list of which patents, trade-marks, copyrights, contracts, applications and other properties and rights so far as now available is hereto attached and marked 'Exhibit A' and

is made a part hereof as fully and completely as if copied in the body of this demand, but this demand is intended to cover any and all patents, trade-marks, copyrights, contracts, applications, and other properties and rights above described whether included in said 'Exhibit A' or not, and

"I, acting as such Alien Property Custodian as aforesaid, and under the instructions and directions as aforesaid, do further require and demand that you immediately account for and return to me, as such Alien Property Custodian, all income, proceeds, profits or other benefits or rights which have accrued to or been received by you growing out of said patents, trade-marks, copyrights, contracts, applications or other properties or rights above mentioned and described.

"In any such accounting by you for said property and property rights described herein and in 'Exhibit A' hereto annexed and the proceeds or income therefrom, as hereinabove demanded and mentioned, due credit and allowance will be given to you for the consideration, if any, paid by you or for your account to the Alien Property Custodian therefor and any balance which may be found to be due to you on account thereof if any such balance be found, will be restored to you to the extent which may be permitted by law and agreeable to the principles of equity, and

"I, as such Alien Property Custodian aforesaid, and acting under the instructions and directions aforesaid, do further demand and require that after the receipt by you of this notice you make no further transfers, licenses, assignments or other dispositions of any of the property, rights, income or other interest above mentioned and referred to, and that in the event that any such transfers, licenses, assignments or other dispositions are made by you that the same will be made at your peril and you will be held strictly accountable therefor.

"Witness my hand and official seal this 8th day of July, 1922.

"THOMAS W. MILLER,
"Alien Property Custodian."

GARVAN CHARGES GERMAN INTRIGUE

On the day immediately preceding the sending of the above, however, Mr. Garvan issued a further statement in response to numerous inquiries which, because of its illuminating character, is here given in full:

"I had not intended to make any further statement until the demand of the Alien Property Custodian has been served upon us, and will not do so with reference to the suits involving the Foundation itself.

"I have been asked so urgently and frequently two questions by the papers that I feel I should not wait until the demand is served.

"The first question asked is what justification I had for saying in my first statement, 'This action was taken without any notice to the American organic chemical industry or to the Chemical Foundation or any of its officers or to, in fact, anyone equipped to speak for this essential American industry in peace and war. It has been begun, I am informed, after a full hearing by the representatives of the German Cartel, the German dye trust and the German Government without any American interest being given an opportunity to be heard in reply.'

"In answer thereto I desire to state:

"1. Within about three weeks a commission, consisting of three German lawyers, Rudolph Oppenheim, Hans Wagner and Karl Holderman, representing the German Cartel, which in turn consists of all the organic chemical industry of Germany, arrived in this country to perfect plans for the recovery by Germany of their control in America of the organic chemical industry. On Saturday, June 24, a conference was held at the office of O'Gorman, Battle, Vandiver & Levy, 37 Wall Street, at which were present Mr. Vandiver and Mr. Levy, representing Herman A. Metz, the leading German importer and agent of the 'I. G.,' and several other lawyers representing the German Embassy and other German interests. It was there decided that a direct action by Germany or by the Cartel to upset the sale to the Foundation would be inexpedient, but that the most promising form of procedure would be to attempt to induce the United States Government to bring the action and to offer to the Government all possible German assistance. Accordingly, a committee was appointed consisting of Messrs. Oppenheim and Wagner, Vandiver and Levy to go to Washington and consult with the Department of Justice.

"2. On Tuesday, June 27, this committee visited the Attorney-General's office and there placed before his assistants the German proposition and offered German assistance. Prior to that time neither the Chemical Foundation nor anyone in any way representing them nor anyone representing any part of the American organic chemical industry had been asked any question in reference to the sale, and subsequent to the visit of the German representatives no request or opportunity was given to any American interests to answer the German representations before the announcement of the intended demand was made.

"The second question which has been continuously asked me is for what other sale in reference to patents will the Foundation case become a governing precedent. In answer thereto, first, the sale of all wireless patents and plans to the United States Government 'for the nominal sum of $140,000.' Germany had obtained the domination in this country through a patent system similar to the chemical patent system and to free the country from that control they were all sold to the Government for what, of course, is an inadequate price if you consider the value to Germany of the control of the wireless news of the world.

"Second, some 5,700 German patents were selected by the army and navy as having been taken out by the Germans to control our freedom in waging war. These patents covered gun sights and countless other appli-

ances and devices either used by our army or navy or which might be used in the future. Many of them had been infringed upon by the army and navy in the winning of the war. The Alien Property Custodian turned over to the United States all the German rights and interests as between this Government and German interests to the navy for the nominal sum of $100,000. This transaction will also have to be upset."

Foundation's Suits Were Friendly, Declares Choate

In order to clear up another point referred to in some of the statements included in the collection, there here follows an explanation of the suits instituted by the Foundation from Joseph H. Choate, Jr., its counsel. This was put forth just too late for inclusion in our issue of July 3, but was made public before anyone had an inkling of the intended action of the President and Mr. Daugherty. The explanation declares:

"Statements which have recently appeared in the press in regard to the commencement of certain suits by the Chemical Foundation against a number of manufacturers have apparently produced a false impression. Some of these intimated that the companies thus sued were charged with improper, if not unlawful, acts. Nothing could be farther from the truth. The suits are entirely friendly actions, brought to establish the title of the Foundation to the funds long since paid by the defendants as royalties for the use of patents now owned by the Foundation, under licenses issued by the Federal Trade Commission. The Trading with the Enemy act provided that these funds be held in the United States Treasury as a trust fund for the owner of the patents and for the licensees, as their respective rights might be determined by suits to be brought by the owner against the licensees. This provision compelled the Foundation, which would have no difficulty in agreeing with almost all of the licensees, to bring such suits as the only means of securing from the Treasury moneys to which it is entitled. The companies sued have, generally speaking, done everything that they should in the matter and nothing that they should not."

The Laughlin Textile Mills, Inc., Waterford, N. Y., has been incorporated to manufacture bindings, braid, yarn, thread, etc., with a capital of $150,000. Incorporators include Edwin B. Laughlin, 14 Saratoga Avenue, Waterford, N. Y.; Edwin T. Laughlin, Waterford, and Joseph H. Reaney, St. Johnsville.

The Standard Chemical Products Company, Hoboken, N. J., has been incorporated with a capital of $25,000. The incorporators are Henry Ruegg, Jr., Lincoln Levine and Louis L. Grombacher, 1021 Grand Street, Hoboken.

NATIONAL IMPROVES ON FORMER CHROME COLOR CARD WITH NEW EDITION

The National Aniline & Chemical Company, Inc., has brought out a revised color card, showing its chrome colors on yarn, which is more informative and comprehensive than the previous issue.

The three methods of chrome dyeing are specifically treated—ortho-chrome process, after-chroming process and the chrome bottom process—and full particulars for the preparation of these baths are given.

These are followed by a chapter on the subsequent shading of the dyeings which will be found of great value to the wool dyer. After this are lists showing which of the chrome colors made by the National Aniline & Chemical Company, Inc., are best suited to various properties; as, for instance, those suitable for machine dyeing, those of best fastness to milling, those of best fastness to carbonizing, those particularly adapted for the production of combination shades, those which leave cotton effects unstained and those which leave silk effects unstained.

A further list of colors suitable for dyeing in copper machines, and those for dyeing in iron machines, is given, and the instructive part of the book is closed by a brief but comprehensive description of the properties of "National" chrome colors.

The samples themselves are arranged in knots so designed that the velvet test on the ends can be easily made, and are so tied that threads can be easily withdrawn for matching purposes.

At the end of the color card samples of shades obtained by the three standard methods of chrome dyeing are given in a separate division.

AMERICAN DYEWOOD HOLDS ANNUAL CONVENTION

The annual convention of the executive, sales and production departments of the American Dyewood Company was held in New York City on Tuesday and Wednesday, June 27 and 28.

The first session was held at the Downtown Association, and was preceded by a luncheon. A number of subjects in the interest of the business were discussed by representatives from the New York, Philadelphia, Boston and Chester offices. This was followed in the evening by a dinner given at the Hotel Commodore. The next day all of the representatives from the various locations inspected the company's plant at Chester, Pa.

Fifty Pittsburgh women chemists, the largest group in any city of the United States who have completed regular courses in chemistry and are making it their life profession, have applied for an Iota Sigma Pi charter and expect as a feature of the coming September convention of the American Chemical Society to be installed as a regular chemical society of women, of which there are relatively few in the United States.

SAYS GERMAN COTTON MANUFACTURERS DO NOT WANT MARK STABILIZED

U. S. Commercial Attache Explains Situation in Central Europe

It appears that German manufacturers of cotton textiles fear more than anything else a development in German financial affairs which may involve a stabilization of the mark. Recent declarations on the part of large manufacturing groups indicate a general feeling that, in the absence of a new sharp decline in mark exchange, a very dull period may be expected. The reasons are more or less obvious, but it is interesting to review them once more.

From the beginning of February until the middle of April the cotton-textile industry of Germany experienced a boom of large proportions. Although there was some export, the main cause of the era of prosperity was the tremendous domestic demand, largely speculative in character. The stationary or slight upward tendency of the mark within the past four weeks has brought this boom period to a close. Germans are no longer buying merely for the purpose of getting their wealth into goods rather than keeping it in paper money, but are restricting themselves to covering their real needs. In any case, the recent overbuying would most certainly have been succeeded by a period of relative depression.

It so happens that the end of the unusual prosperity comes contemporaneously with the demand for wage increases on the part of the weavers. The hourly wage for male weavers in the Augsburg district is now 16.50 marks, and for female help about 12.50 marks. This represents a 70 to 80 per cent raise. Furthermore, the demand of the workers that all talk of a 48-hour week be postponed has had to be agreed to.

All sales contracts recently concluded for cotton textiles in the Augsburg region have contained a specification that whenever the wage scale goes up 10 per cent a price increase not less than 2 per cent and not greater than 3 per cent is to be accepted by the purchaser. As a result of recent wage advances, buyers of textiles are obliged to pay a supplement of more than 20 per cent on their newest contracts. The jobbers and large merchants are concerned with this 20 per cent raise, particularly in view of the slump in the domestic demand. The manufacturers seem resolved to make the jobbers bear the loss incident to the falling market, while the jobbers declare that whatever loss there is ought to be apportioned.

Though many mills have been reporting that they had orders to keep them occupied for a number of months, the real volume of business may have been exaggerated, in case jobbers or merchants relying chiefly on internal demand are obliged to default their contracts. A partial saturation of the inland market having been reached, it remains for the manufacturers to consider whether the export trade can be more fully developed. This, as has already been pointed out, they feel can only be accomplished in the event of further mark depreciation, which, according to their past experience, simultaneously stimulates export and creates speculative demand in the home market.

L. C. LEWIS NOW IN BUSINESS AS LEWIS TESTING COMPANY

L. C. Lewis, formerly raw-silk inspector for the Wilkes-Barre Silk Company, and author of several articles on raw silk which have appeared in The Reporter, has gone into business for himself under the name of the Lewis Testing Company, with offices at 95 Madison Avenue, New York City.

MOTH DESTROYER

In the preparation of para-dichlorbenzene there is always a certain quantity of the para-dichlor compound made which has to be separated from the monochlor derivative. In developing uses for the para-dichlorbenzene, it has been found that it acts as an excellent cloth preservative. Hitherto, camphor and naphthalene have been the principal agents employed in the preservation of woolen materials or furs from the destructive action of moths or similar insects. Camphor is generally too high in price for most purposes, and this is especially true at the present time. Naphthalene is relatively cheap and efficient, but its odor is rather disagreeable and on this account it is not possible to use it in many cases. The para-dichlorbenzene is said to be as efficient a moth destroyer as these other products, and, furthermore, the odor is not at all disagreeable, being slightly aromatic and ethereal. The compound appears to act as a distinct poison on various objectionable insects, and also its action takes place in a relatively short time. The para-dichlorbenzene may be employed in the form of crystals, powder, tabloids or small balls of a similar size to those of the ordinary camphor balls.—"Dyer & Calico Printer."

ACTION OF LIGHT ON TEXTILE FABRICS

Recent German experiments regarding the action of light on textile fabrics showed, states Trade Commissioner H. D. Butler, London, England, that while in the case of wool fabrics no appreciable action takes place, the lighting of silk fibers reduces the tearing strength of silk after twenty-four hours' exposure one-third and the extensibility nearly two-thirds. Cotton fibers showed an even greater sensitiveness to light, the tearing strength dropping from 5.8 grams to 1.9 grams. The fiber most affected is flax, whose tearing capacity dropped from 19.7 to 4.83 grams.

F. W. Barker, Jr., has resigned from the National Aniline & Chemical Company, Inc., and has become associated with the Kaumagraph Company, 209-219 West Thirty-eighth Street, New York City.

JAPAN IMPORTING WOOLEN CLOTH

British and German woolen cloth is proving cheaper than the local product in Japanese markets. The output of Japanese mills is estimated at 25,000,000 yards and the domestic demand as 33,000,000 yards. The prices of German woolen cloths recently imported have ranged from 4 to 5 yen per yard.—"Chamber of Commerce Journal," Yokohama.

DU PONT ANNOUNCES PONTACYL FLAVINE FF AND TARTRAZINE O

The Dyestuff Sales Department, E. I. du Pont de Nemours & Co., announces placing on the market Pontacyl Flavine FF, which product is like Azo Flavine. This color adds to the company's line of acid colors a new yellow or reddish shade which dyes very evenly. It is used to some extent for self shades on yarn and pieces, but principally for shading other colors and for the production of fashion shades on ladies' dress goods, wool felts, plushes, carpet and fancy yarns where fastness to stoving is not required. As is well known, it was one of the very important types of acid yellow prewar both for wool and silk.

The Dyestuffs Sales Department also announces that it has prepared and is ready to offer to the trade Du Pont Tartrazine O.

This is a very bright greenish shade of yellow possessing very good resistance to light. It is a very level dyeing color and can be readily used for shading, even at the boil. It finds extensive use in the carpet industry as well as the ladies' dress goods trade.

Descriptive circulars will be supplied by the company on request.

NEW MICRO-PHOTOGRAPHIC SOCIETY TO MEET AT CHEMICAL SHOW

Canadians to Demonstrate Use of Water Power

In the recent formation of the Technical Photographic and Microscopical Society, composed of many well-known chemical engineers, physicists, and mathematicians, the textile, paper, leather, rubber, metal and paint industries of America will undoubtedly find a solution of many of their problems. Unified effort among the leaders in micro-photographic work has long been lacking in the United States, and the first meeting of the new society held recently in New York, marked the initial step in broadening the field of photography in the leading chemical consuming industries. Among the fifty experts who have affiliated with the technical photographers, are included representatives of the Eastman Kodak Company, Western Electric Company, Bausch & Lomb, General Electric Company, the United States Bureau of Standards and others.

The next regular meeting of the new technical photographic society will be held in conjunction with the Eighth National Exposition of Chemical Industries during the week of September 11-16, at the Grand Central Palace, New York, on Thursday afternoon, September 14. In addition to meeting, the organization has already made arrangements for the display and explanation of the work of individual members in technical micro-photography and its application to the everyday problems of the chemical or chemical consuming plant. A booth at the Exposition has been reserved for the purpose. A. E. Buchanan, of the McGraw-Hill Company, New York, is chairman of the general committee on exhibits.

Among those who are expected to be heard at the Chemical Exposition meeting of the society, are Dr. E. C. Kenneth Mees, of the Eastman Kodak Company, John H. Graff, of the Brown Company, Berlin, N. H.; Susan B. Leiter and Dr. W. H. Whitney, of the General Electric Company; Henry Green, of the New Jersey Zinc Company, and other micro-photographic authorities. Other associations, announcement of whose meetings in conjunction with the Chemical Exposition has already been made, who are lining up their programs for the September gatherings, include the Salesmen's Association of the American Chemical Industry, the American Ceramic Society and the Technical Association of the Pulp and Paper Industry. Later announcements of the programs of these societies will be made.

The almost unlimited resources in water power and forest products of Canada with its pulp and paper mills, and wood distillation plants already in operation, will be the subject of the exhibit by the Canadian Department of the Interior at the Exposition. The Forest Products Laboratories of Canada, in co-operation with McGill University, will demonstrate the possibilities of Canada's undeveloped water power and forests for American capital, and display at the Exposition the variety of chemical products made from the natural resources of the Dominion by various electrical processes. A representative of the Forestry Branch of the Department of the Interior will also be present to explain, by the use of maps and samples, the distribution of raw materials available for further development.

That the very same asphalt used by Christopher Columbus on his third voyage to America to caulk his ships should be one of the chief sources of material for the manufacture of acid-proof floors for chemical plants and laboratories, will be demonstrated at the Exposition by the Barber Asphalt Company, of Philadelphia. The romance of the Island of Trinidad, with its famous asphalt lake, which has furnished more paving material for streets of the world's cities than any other source, and the numerous applications of this material and its derivatives in the chemical industry, will be shown.

Some of the best known scientific men in the United States, including Thomas A. Edison, visited the National Exposition of Chemical Industries last year and traveled from exhibit to exhibit unknown and unnoticed in the large crowds which attended. At the Exposition this year the arrangement of the program, including meetings of several of the leading chemical and allied associations in conjunction with the Exposition, is expected to bring together again under one roof the largest gathering of scientists in this country during the past year.

CAMPBELL ANNOUNCES MOHAWK BROWN

John Campbell & Co., 75 Hudson Street, New York City, announce to the trade "a super Bismarck Brown" under the brand name of Mohawk Brown.

"Bismarck Brown has been known to the dyestuff trade for many years," states the company's announcement, "but in view of the fact that Mohawk Brown is made in America, from American raw materials, and by American workmen, it is only just and proper that it should carry a distinctive American name.

"We believe that Mohawk Brown is superior in solubility, brightness and concentration to any Bismarck Brown now sold—another reason why it should carry a distinctive name. Mohawk Brown is chemically the same in every respect as the pre-war Bismarck Brown.

"In introducing Mohawk Brown to the consumer, we are placing at his disposal a product which will more than ever prove the ability of the American manufacturer to produce dyestuffs of the first quality. We manufacture Mohawk Brown completely from the coal tar distillate to the finished color.

"Mohawk Brown is fairly priced. A product sample will be sent upon request."

JAPANESE EXPORTS OF KNIT GOODS LARGE

There were 335,400 dozens of hosiery, valued at 1,343,300 yen, exported from Osaka in April, as compared with only 7,200 dozens, valued at 15,300 yen, in March. The principal destinations for these goods were India, Africa, Hongkong, and the Philippines. This increase is explained more or less by the arrival of large consignments of European goods in Osaka as well as seasonal demand.

AGENDA OF BRAZILIAN COTTON CONGRESS

The Sociedade National de Agricultura has called an international cotton congress at Rio de Janeiro, Brazil, October 15-18, 1922. Questions to be discussed are the development of cotton production in Brazil and foreign countries; the selection, milling, grading, baling, shipping, and trading of cotton and its by-products; prevention of cotton diseases; international cotton reserve; and other subjects of interest to the production and commerce of cotton. Earlier mention of this conference was made in "Commerce Reports" for March 13, 1922, and additional information concerning it may be obtained from the Textile Division by referring to file No. 47357.

VENEZUELA PURCHASING FINE COTTON GOODS

Imports of high-grade cotton goods, khakis, and palm beach cloths from the United States and of drills from England and Spain are being made at La Guayra, according to Vice-Consul S. J. Fletcher. Also a limited import trade in cotton knit underwear and hosiery from the United States and England is in progress. Stocks of cheap cotton goods are steadily diminishing, and it is generally conceded six months will elapse before normal buying conditions for cotton goods will prevail.

BRITISH FASTNESS REQUIREMENTS FOR COLORED FABRICS

Recommendations have been made to the British National Council of Dyes and Colours with a view towards the formulation of a comprehensive scheme outlining the proper qualities of fastness to be expected of colors in textile fabrics. The commercial requirements for fastness of colors on the several lines of staple fabrics are fairly simple in character, but so far they have lacked proper definition. If the National Council succeeds in formulating an acceptable standardization in this respect it will have accomplished a very excellent bit of constructive work.

The general outline of the recommendations include, first, an outline of fastness requirements classified with respect to the material dealt in and comprising the chief staple fabrics, and second, an outline of the character of the tests to be applied. The fastness requirements are as follows:

Ladies' Blouse Materials:
Silk (non-washable)—rubbing, light (2), hot pressing;
Silk (washable)—rubbing, light (2), washing (1), hot pressing;
Cotton—rubbing, light (2), washing (3), hot pressing.

Ladies' Dress Materials:
Silk—hot pressing, artificial light, light (1);
Cotton—hot pressing, washing (3), light (1);
Wool—hot pressing, light (2).

Gentlemen's Suitings:
Wool—hot pressing, light (3);
Cotton—hot pressing, light (3), washing (2).

Coat Linings:
Silk—perspiration, hot pressing, rubbing;
Cotton—perspiration, hot pressing, rubbing;
Union—perspiration, hot pressing, rubbing.

Hosiery:
Silk—washing (2), perspiration, rubbing;
Cotton—washing (3), perspiration, rubbing;
Wool—washing (2), perspiration, rubbing;
Fiber Silk—washing (2), perspiration, rubbing.

Hat Bands:
Silk—light (3), water, weather, hot pressing;
Cotton—light (3), water, weather, hot pressing.

Necktie Fabrics:
Silk—light (1), rubbing, hot pressing;
Cotton—light (1), rubbing, washing (2).

Underwear and Sleeping Garments:
Silk—washing (2), perspiration, rubbing;
Cotton—washing (3), perspiration, rubbing;
Wool—washing (2), perspiration, rubbing.

Shirtings:
Silk—washing (2), perspiration, rubbing;
Cotton—washing (3), bleaching (desirable but not necessary), perspiration, rubbing, hot pressing;
Wool—washing (2), perspiration, rubbing.

Hat Felts:
Fur or Wool—light (3), water, weather.

Carpets and Rugs:
Wool—light (2), rubbing, cold water;
Cotton—light (2), rubbing, cold water.
Silk—light (2), rubbing, cold water.
Upholstery and Drapery Materials:
Silk—light (2);
Cotton—light (2);
Wool—light (2).
Window Shade Materials:
Cotton—light (3).
Window Curtain Materials:
Silk—light (3);
Cotton—light (3).
Awning Materials:
Cotton—light (3), weather.
Bookbinders' Cloth:
Cotton—rubbing, hot pressing.
Horse Blankets:
Wool—perspiration, light (3), washing (3).
Fabrics for Rubberizing:
Cotton—light (2), vulcanizing, hot pressing;
Silk—light (2), vulcanizing, hot pressing.
Bathing Suits:
Silk—light (3), salt water, washing (2);
Cotton—light (3), salt water, washing (2).
Wool—light (3), salt water, washing (2).

The general outline of the tests proposed in correspondence with the above is as follows.

Light (1)—10 days south exposure inside window or, 10 hours to test lamp.
Light (2)—20 days south exposure inside window, or 20 hours to test lamp.
Light (3)—30 days south exposure inside window, or 30 hours to test lamp.
Washing (1)—neutral soap at 90 deg. Fahr.
Washing (2)—neutral soap at 130 deg. Fahr.
Washing (3)—laundry (alkaline) soap at 140 deg. Fahr.
Hot pressing—with iron at 300 deg. Fahr. (temperature of iron).
Perspiration—lactic acid 4 deg. Tw., 1 hour at 100 deg. Fahr. with white cloth.
Bleaching—hypochlorite, cold at ½ deg. Tw.
Water—cold water 2 hours with white cloth.
Weather—exposure to weather for one week.
Salt water—steep in 3 per cent solution of common salt for 2 hours cold.
Rubbing—rubbing dyed fabric on white dry handkerchief.

Dr. Earle K. Strachan, research chemist for the National Aniline & Chemical Company, Inc., Buffalo, N. Y., has been appointed assistant professor of physical chemistry at Brown University, Providence, R. I. He is a graduate of the Worcester (Mass.) Polytechnic Institute, class of '08. Last year he supervised the development of new methods of analysis of dyes.

NOTES OF THE TRADE

The capital stock of the Jerico Silk Mills, Phillipsburg, Pa., has been increased from $30,000 to $100,000.

The Myerstown Hosiery Company has been incorporated to manufacture hosiery and knit goods. Capital is $250,000. Incorporators are F. R. Hansell, J. Vernon Pim, E. M. MacFarland, Philadelphia.

Lodz (Poland) textile mills during the second six months of 1921 imported 21,590 metric tons of cotton, compared with 18,515 tons the previous six months. Wool imports, however, fell off, 6,400 tons being imported during the last half of the year compared with 6,587 tons in the first half.

Manifests at Manila indicate that the Philippine Islands are buying increasing quantities of muslins from Japan, especially unbleached cloths, but these are said to be poor in quality. The bulk of the cotton-piece-goods business is carried on with the U. S.

Samuel K. Meister, well known as an expert dyer in Paterson, N. J., died in that city on June 4. For ten years he had been head dyer for the Lanza Silk Dyeing Company, and previous to that time was with the Weidmann Silk Dyeing Company.

The Thomas J. Gallagher Company, Inc., New York, has incorporated as importer and converter of silk laces, velvets, etc., with a capital of $50,000. Incorporators are M. C. Gallagher and T. J. Gallagher, New York, and William Callahan.

The Peerless Dyeing & Finishing Company, Woonsocket, R. I., has incorporated with a capital of $100,000. Incorporators are Aime E. Bonin, treasurer of the Woonsocket Spinning Company, who will be president of the new company; William E. Lamarie, of Providence, who will be treasurer, and John F. Buessette, of Woonsocket, who is to be secretary. The new concern will handle dye tops, skein dyes, piece dyes and noils.

With the dissolution of the Purchasing and Selling Association of Czecho-Slovak Cotton Manufacturers, the Czecho-Slovak Government has available for sale 2,200,000 pounds of cotton yarns and about 100 bales of cotton. The association's deficit is reported as amounting to 200,000,000 crowns.

WANTED, COLORIST

Dyestuff manufacturer requires well-trained and experienced colorist familiar with the practical application of foreign and domestic dyes to textiles. This is an excellent opportunity for an experienced man. Box 11, care of Oleck Advertising Service, 1133 Broadway, New York.

D. G. Dery, Inc., has filed a charter at Dover, Del., to engage in the manufacture of all kinds of wool, silk and other textiles. The capital is $25,000,000. Incorporators include Claude Kiss, Frederick D. Searing and J. W. Perkins, of New York.

The Pickwick Silk Mills, 136 Washington Street, Paterson, N. J., have incorporated with a capital of $25,000.

The Atlantic Silk Hosiery Company, Inc., 20 Mercer Street, Paterson, N. J., has incorporated to manufacture and deal in silk hosiery, etc., with a capital of $150,000. Incorporators are John A. Harsche, Paterson, and Henry M. Lukstadt and Felix F. Sandewski, of Boonton.

A permit has been issued to the R. K. Laros Silk Company, Bethlehem, Pa., for a new plant to be erected at a cost of $100,000.

The first estimate of 1922 Japanese sericulture includes gatherings up to May 1, and shows that 2,241,003 egg papers with 100 moths on each sheet, or a decrease of 0.03 per cent from the corresponding period last year, were gathered. Heavy rains and cold winter weather withered young twigs and caused the growth of mulberry leaves to be generally unsatisfactory.

It is reported that the Riverside Silk Mills, Ltd., of Galt, Ont., are to build a three-story addition to the plant to cost about $100,000.

The Mianus Woolen Company, Greenwich, Conn., has been incorporated to manufacture and deal in woolen goods with a capital of $500,000. Incorporators are Fred A. Springer, Greenwich; Miner D. Randall, Norwalk, and William J. Foster, Norwalk.

The Childers Brothers Chemical Company, Lake Wales, Tex., has been incorporated with a capital of $10,000. Reuben R. Childers is president, George E. Childers vice-president and P. M. Childers secretary, all of Lake Wales.

The American International Silk Corporation, Dover, Del., has been incorporated to manufacture, sell and deal in and with raw and manufactured silk. Capital is $500,000. Incorporators are Cornelius A. Cole, Hackensack, N. J.; Robert A. Van Voorhis, Jersey City, N. J., and Arthur R. Oakley, Pearl River, N. Y.

Sylvan Knitwear Mills, Inc., Brooklyn, N. Y., has been chartered and will make sweaters and apparel for men and women. Capital is $20,000. Incorporators are M. Walter Rosen, Isadore Miller, Brooklyn, and Irving Saffran, 135 East Broadway, New York City.

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